GEOLOGIC MAP OF THE SUNNYMEAD 7.5' QUADRANGLE, RIVERSIDE COUNTY, CALIFORNIA

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Prepared in cooperation with
CALIFORNIA DIVISION OF MINES AND GEOLOGY
and
U.S. AIR FORCE

Open-File Report OF 01-450

2001

U.S. DEPARTMENT OF INTERIOR
U.S. GEOLOGICAL SURVEY

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INTRODUCTION

General

Open-File Report 01-450 contains a digital geologic map database of the Sunnymead 7.5' quadrangle, Riverside County, California that includes:

1. ARC/INFO (Environmental Systems Research Institute, http:/www.esri.com) version 7.2.1 coverages of the various elements of the geologic map.
2. A Postscript file to plot the geologic map on a topographic base, containing a Correlation of Map Units diagram (CMU), a Description of Map Units (DMU), and an index map.
3. Portable Document Format (.pdf) files of:
    a. This Readme; includes in Appendix I, data contained in sun_met.txt
    b. The same graphic as plotted in 2 above. Test plots have not produced 1:24,000-scale map sheets. Adobe Acrobat page size setting influences map scale.

The Correlation of Map Units and Description of Map Units is in the editorial format of USGS Miscellaneous Investigations Series (I-series) maps but has not been edited to comply with I-map standards. Within the geologic map data package, map units are identified by standard geologic map criteria such as formation-name, age, and lithology. Where known, grain size is indicated on the map by a subscripted letter or letters following the unit symbols as follows: lg, large boulders; b, boulder; g, gravel; a, arenaceous; s, silt; c, clay; e.g. Qyf_a is a predominantly young alluvial fan deposit that is arenaceous.

Multiple letters are used for more specific identification or for mixed units, e.g., Qfy_{sa} is a silty sand. In some cases, mixed units are indicated by a compound symbol; e.g., Qyf_{2sc}. Marine deposits are in part overlain by local, mostly alluvial fan, deposits and are labeled Qomf. Grain size follows f.

Even though this is an Open-File Report and includes the standard USGS Open-File disclaimer, the report closely adheres to the stratigraphic nomenclature of the U.S. Geological Survey. Descriptions of units can be obtained by viewing or plotting the .pdf file (3b above) or plotting the postscript file (2 above).

This Readme file describes the digital data, such as types and general contents of files making up the database, and includes information on how to extract and plot the map and accompanying graphic file. Metadata information can be accessed at http://geo-nsdi.er.usgs.gov/metadata/open-file/01-450 and is included in Appendix I of this Readme.

HOW TO OBTAIN PAPER PLOTS

For those having access to large-format plotters such as HP650C, HP755C, and HP2500C, plots may be made directly from the included plot file.

DATABASE CONTENTS

The files constituting the geologic map database of this Open-File Report are listed below along with the interchange files from which they were extracted.

Data Package

All files listed below are in a compressed tar file named stp.tar.gz (2.7 Mb); see section below titled, SOFTWARE UTILITES.

ARC/INFO interchange files	Sunnymead coverages	Contains
sun_geo.e00	sun_geo	Contacts, faults, geologic unit labels
sun_ano.e00	sun_ano	Annotation subclasses: GEO (for plotting unit labels)
sun_str.e00	sun_str	Attitudes and their dip values. Dip values plotted as annotation.

The directory, info/, is produced in the process of importing interchange files to ARC coverages in ARC/INFO. The sun (Sunnymead) info/ directory contains:

Feature Attribute Tables

Polygon attribute table	sun_geo.pat
Arc attribute table	sun_geo.aat
	sun_ano.aat
Point attribute table	sun_str.pat

Raster file	Resultant image	Contains
sun.tif	Sunnymead base map	Topographic base from 500 dpi scan of USGS Sunnymead 7.5' quadrangle, 1967

Plot Package

Postscript plot files of the geologic map and explanation; please see section below titled, SOFTWARE UTILITIES for additional information.

Compressed file	Resultant image	Contains
sun_map.ps.gz	sun_map.ps	PostScript plot file of geologic map and CMU/DMU

The Postscript file is compressed using winzip.

The uncompressed PostScript file sun_map.ps will plot a 1:24,000 scale, full color geologic map of the Sunnymead quadrangle on the topographic base. A detailed CMU diagram, a DMU are included on the sheet. The sheet is in the editorial format of the U.S. Geological Survey's Miscellaneous Investigations (I) map series, and is approximately 50 X 36 inches in size. The map sheet has been successfully plotted on Hewlett-Packard large-format plotters, models HP650C, HP755C, and HP2500C.

Symbols Package

Files in the plot package have been prepared to produce optimum plots using the shade and marker sets and fonts listed below; these symbol sets and fonts are included in a compressed tar file named symbols.tar.gz (0.04 Mb); see section below titled SOFTWARE UTILITIES.

geoSCAMP2.lin	Lineset
geoSCAMP2.mrk	Markerset for points
alc1.shd	Colors
geology2.shd	Pattern fills
fnt026	Font required for geoSCAMP2.lin
fnt037	Font required for geoSCAMP2.mrk
fnt035	Font required for geology2.shd

Special geologic characters used in unit designations are from the Geoage font group and may be obtained at the following web site:

Server:	onyx.wr.usgs.gov
UserID:	anonymous
Password:	Your e-mail address
Directory:	pub/wpg/supplies/geoage

Other files

README.pdf	This document
sun_map.pdf	Postscript plot file of geologic map and CMU/DMU

SOFTWARE UTILITIES

Files which have a .gz file extension were compressed using gzip. Gzip utilities are available free of charge via the Internet at the gzip home page, http://www.gzip.org. Files with a .zip file extension were compressed using WinZip, available at http://www.winzip.com.

The data package and symbols package are additionally bundled into a single tar (tape archive) file. The individual files must be extracted using a tar utility, available free of charge via the Internet through links on the Common Internet File Formats page, http://www.matisse.net/files/format.html. One such utility is WinZip, available at http://www.winzip.com.

HOW TO OBTAIN THE DIGITAL FILES

The export files, and subsequently the data and plot files, constituting the geologic map database of this Open-File Map may be obtained in two ways, both over the Internet.

1. The files can be obtained via the Web from Western Region Geologic Information Server. Go to the web page at http://geopubs.wr.usgs.gov/open-file/of01-450 and follow the directions to download the files.
2. The files can also be obtained by anonymous ftp over the Internet from wrgis.wr.usgs.gov. The files are located in the directory /pub/open-file/. Be sure to use binary transfer mode or ASCII mode for individual .e00 (ARC interchange file format) files.

HOW TO EXTRACT THE GEOLOGIC MAP DATABASE FROM THE TAR FILE

Digital database

After downloading the files, they must be uncompressed using a gzip utility such as gzip itself or WinZip. The data files must then be extracted using a tar utility or Winzip.

This process will create a directory, sun/, that will contain the ARC/INFO interchange files and supporting files. The directory should contain the following files:

sun/

- sun_geo.e00
- sun_str.e00
- sun_ano.e00

- sun.tif

The symbols.tar.gz file is imported using the same methods as for the lkm.tar.gz file. It will create a directory, symbols/ that will contain the following files:

- geoSCAMP2.lin
- geoSCAMP2.mrk
- alc1.shd
- geology2.shd
- fnt026
- fnt037
- fnt035

The following are not included in the database tar file, and are downloaded separately.

- sun_map.ps.gz
- Readme.pdf
- sun_map.pdf

Postscript plot files

Make a 15 MB uncompressed file, sun_map.ps (plot of complete map), by typing gzip -d sun_map.ps.gz (or use gzip utility of choice).

Portable Document Format (.pdf) files

PDF files are not stored as gzip files. They are accessed using Adobe Acrobat Reader software, available free from the Adobe website http://www.adobe.com. Follow instructions at the website to download and install the software. Acrobat Reader contains an on-line manual and tutorial.

HOW TO CONVERT THE ARC/INFO INTERCHANGE (EXPORT) FILES

The ARC interchange (.e00) files are converted to ARC coverages using the ARC command IMPORT.

ARC interchange files can also be read by some other Geographic Information Systems, including ArcView (ESRI) and MapInfo (http://www.mapinfo.com), (Environmental Systems Research Institute, Inc., 1998). Please consult your GIS documentation to see if you can use ARC interchange files and the procedure to import them.

DIGITAL GEOLOGIC MAP SPECIFICATIONS

Digital compilation

The geologic map information was hand digitized from a base-stable original (ink on a greenline) of the geologic map at 1:24,000 scale. Digital tics were placed by hand at latitude/longitude intersections. The lines, points, and polygons were edited using standard ARC/INFO commands, and in some places, interactively by hand using graphical user interface ALACARTE (Fitzgibbon, 1991, Fitzgibbon and Wentworth, 1991, Wentworth and Fitzgibbon, 1991). Digitization and editing artifacts significant enough to display at a scale of 1:24,000 were corrected.

Base map

The base map image (sun.tif) was prepared by scanning a scale-stable clear film of the U.S. Geological Survey, 1:24,000 Sunnymead 7.5' quadrangle (1967) topographic map. Scanning was done using an Anatech Eagle 4080 monochrome 800 dpi scanner; at a resolution of 500 dpi. The raster scan was converted to a monochromatic image in ARC/INFO, and registered and rectified to the Sunnymead 7.5' quadrangle. No elements of the base layer are attributed. The base map is provided for reference only.

Spatial resolution

Use of this digital geologic map database should not violate the spatial resolution of the data. Although the digital form of the data removes the constraint imposed by the scale of a paper map, the detail and accuracy inherent in map scale are also present in the digital data. The fact that this database was edited at a scale of 1:24,000 means that higher resolution information is not generally present in the dataset. Plotting at scales larger than 1:24,000 will not yield greater *real* detail, although it may reveal fine-scale irregularities above the intended resolution of the database. Similarly, although higher resolution data is incorporated at a few places, the resolution of the combined output will be limited by the lower resolution data.

Map accuracy standards

Until uniform National geologic map standards are developed and adopted, lines and points on SCAMP 1:24,000 scale geologic maps that are located to within 15 meters, relative to accurately located features on the base map, are considered to meet map accuracy standards. Dashed lines, indicated in the database as approximately located or inferred, are generally located within 30 meters, relative to accurately located features on the base map.

Faults and landslides

This database is sufficiently detailed to identify and characterize many actual and potential geologic hazards represented by faults and landslides, but it is not sufficiently detailed for site-specific determinations. Faults shown do not take the place of fault rupture hazard zones designated by the California State Geologist (see Hart, 1998).

Database specifics

General--The map database consists of ARC/INFO format coverages, which are stored in polyconic projection (Table 1), and a series of data tables. Digital tics define a 2.5 minute grid of latitude and longitude in the geologic coverages corresponding to the 2.5 minute tic grid on the topographic base map.

Table 1 --- Map Projection

Projection	Polyconic
Datum	NAD27
Zunits	No
Units	Meters
Spheroid	Clark 1866
X shift	0.000000000
Y shift	0.000000000
Parameters	-117 11 15.000 longitude of central meridian
	33 52 30.00 latitude of projections origin
	0.00000 false easting (meters)
	0.00000 false northing (meters)

The content of the geologic database can be described in terms of feature classes that include lines, points, and areas that compose the map. See the metadata text file (Appendix I) for detailed descriptions.

Lines – Lines are recorded as strings of arcs and are described in an arc attribute (.aat) table. Complete lists of the line types (LTYPE) used in the quadrangle are available in Appendix I. They represent contacts and faults, which define the boundaries of map units and map boundaries.

Polygons --- Geologic map units (polygons) are described in the polygon attribute (.pat) table (details in Appendix I). For traditional descriptions of the map units, see the Portable Document Format file sun_map.pdf or the Postscript map plot, sun_map.ps. A list of all map units in the database is given in Appendix I.

Points – Point information (attitudes of planar and linear features) is recorded as coordinate and related information. Complete lists of the point types (PTTYPE) used in the point coverage are available in Appendix I.

REFERENCES

Environmental Systems Research Institute, Inc, 1991, ARC/INFO command references 6.0: Proprietary software manual

Fitzgibbon, T.T., 1991, ALACARTE installation and system manual (version 1.0): U.S. Geological Survey, Open-File Report 91-587B

Fitzgibbon, T.T., and Wentworth, C.M., 1991, ALACARTE user interface – AML code and demonstration Maps (version 1.0): U.S. Geological Survey, Open-File Report 91-587A

Wentworth, C.M., and Fitzgibbon, T.T., 1991, ALACARTE user manual (version 1.0): U.S. Geological Survey Open-File Report 91-587C

Appendix I

(Original metadata text)

Identification_Information:

Citation:
Citation_Information:
Originator: Douglas M. Morton
Originator: Jonathan C. Matti
Publication_Date: 2001
Title: Geologic Map of the Sunnymead 7.5' Quadrangle, Riverside County, California
Edition: (Version 1.0, October 03, 2001)
Geospatial_Data_Presentation_Form: vector digital data
Series_Information:
Series_Name: U.S. Geological Survey Open-File Report
Issue_Identification: USGS OFR 01-450
Publication_Information:
Publication_Place: Menlo Park, California
Publisher: U.S. Geological Survey
Online_Linkage: http://geopubs.wr.usgs.gov/open-file/of01-450

Description:

Abstract:

This data set maps and describes the geology of the Sunnymead 7.5' quadrangle, Riverside County, California. Created using Environmental Systems Research Institute's ARC/INFO software, the data base consists of the following items: (1) a map coverage containing geologic contacts and units, (2) a coverage containing structural data, (3) a coverage containing geologic unit annotation and leaders, and (4) attribute tables for geologic units (polygons), contacts (arcs), and site-specific data (points). In addition, the data set includes the following graphic and text products: (1) a postscript graphic plot-file containing the geologic map, topography, cultural data, a Correlation of Map Units (CMU) diagram, a Description of Map Units (DMU), and a key for point and line symbols, and (2) PDF files of the Readme (including the metadata file as an appendix), and the graphic produced by the Postscript plot file.

The Sunnymead quadrangle is located in the northern part of the Peninsular Ranges Province and is underlain by Cretaceous and older basement rocks. This part of the Peninsular Ranges Province is divided into the Perris block, located west of the San Jacinto fault and the San Jacinto Mountains block to the east. The northwest quarter of the quadrangle is crossed diagonally by the San Jacinto fault zone, an important active major fault of the San Andreas fault system. The San Jacinto fault zone consist of a main trace and multiple discontinuous breaks. The main trace forms a dissected, west-facing fault scarp about 1,000 feet

above the valley floor. A vaguely located fault in granitic rocks parallel to and west of the San Jacinto fault zone does not appear to cut Pleistocene age alluvial deposits.

On the northern side of the San Jacinto fault zone is a thick section of Pliocene and Pleistocene continental sedimentary rocks, the upper part of the San Timoteo beds of Frick(1921). The area underlain by these rocks is termed the San Timoteo Badlands. Most of these beds consist of coarse-grained sandstone, conglomeratic sandstone, and conglomerate. All the clasts within these beds were derived from Transverse Ranges basement rocks that are located to the north of the quadrangle. The San Timoteo beds have been deformed into a broad anticlinal structure produced by the sedimentary beds being compressed as they are translated around a restraining bend in the San Jacinto fault north of the El Casco quadrangle. A curving, diachronous fault produced by this compression is located in the western part of the badlands just east of the San Jacinto fault zone.

The area west of the San Jacinto fault zone is underlain by plutonic rocks of the Cretaceous-age Peninsular Ranges batholith with a few small included pendants of schist and gneiss of probable Paleozoic age. Most of the plutonic rocks are of tonalite composition and are mainly biotite-hornblende tonalite. In the northwestern part of the quadrangle is the eastern part of the Box Springs granitic complex, a basinal-shaped complex that appears to be the distal part of a diapiric-shaped complex.

Most of the alluviated area west of the San Jacinto fault zone consists of Pleistocene age fluvial deposits. Most of these deposits have a degraded upper surface. The upper surface of these deposits are preserved in some places near the contact with granitic rocks. The upper part of these deposits form the Paloma surface of Woodford and others(1971). Holocene age alluvial fans emanate from the San Timoteo Badlands.

The geologic map data base contains original U.S. Geological Survey data generated by detailed field observation recorded on 1:24,000 scale aerial photographs. The map was created by transferring lines from the aerial photographs to a 1:24,000 scale topographic base. The map was digitized and lines, points, and polygons were subsequently edited using standard ARC/INFO commands. Digitizing and editing artifacts significant enough to display at a scale of 1:24,000 were corrected. Within the database, geologic contacts are represented as lines (arcs), geologic units are polygons, and site-specific data as points. Polygon, arc, and point attribute tables (.pat, .aat, and .pat, respectively) uniquely identify each geologic datum.

Purpose: The data set for the Sunnymead 7.5' quadrangle was prepared under the U.S. Geological Survey Southern California Areal Mapping Project (SCAMP) as part of an ongoing effort to develop a regional geologic framework of southern California, and to utilize a Geographic Information System (GIS) format to create regional digital geologic databases. These regional databases are being developed as contributions to the National Geologic Map Database of the National Cooperative Geologic Mapping Program of the USGS.

Supplemental_Information: none

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 2001

Currentness_Reference: New data

Status:

Progress: Complete

Maintenance_and_Update_Frequency: As Needed

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -117.25009155

East_Bounding_Coordinate: -117.12490863

North_Bounding_Coordinate: 34.00000057

South_Bounding_Coordinate: 33.87498338

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: geologic map

Theme_Keyword: geology
Theme_Keyword: bedrock geology
Theme_Keyword: alluvial geology
Theme_Keyword: fault
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: California
Place_Keyword: Riverside County
Place_Keyword: Sunnymead 7.5' quadrangle

Stratum:
Stratum_Keyword_Thesaurus: None
Stratum_Keyword: Cretaceous tonalite and granodiorite
Stratum_Keyword: Quaternary deposits
Stratum_Keyword: San Jacinto Fault
Temporal:
Temporal_Keyword_Thesaurus: None
Temporal_Keyword: Cretaceous
Temporal_Keyword: Quaternary
Access_Constraints: None

Use_Constraints:
The Sunnymead 7.5' geologic-map database should be used to evaluate and understand the geologic character of the Sunnymead 7.5' quadrangle as a whole. The data should not be used for purposes of site-specific land-use planning or site-specific geologic evaluations. The database is sufficiently detailed to identify and characterize many actual and potential geologic hazards represented by faults and landslides and posed by ground subsidence and earthquake-generated ground shaking. However, it is not sufficiently detailed for site-specific determinations or evaluations of these features. Faults shown do not take the place of fault-rupture hazard zones designated by the California State Geologist (see Hart, 1988).

Use of this digital geologic-map database should not violate the spatial resolution of the data. Although the digital form of the data removes the constraint imposed by the scale of a paper map, the detail and accuracy inherent in map scale are also present in the digital data. The fact that this database was compiled and edited at a scale of 1:24,000 means that higher resolution information may not have been uniformly retained in the dataset. Plotting at scales larger than 1:24,000 will not yield greater real detail, although it may reveal fine-scale irregularities below the intended resolution of the database. Similarly, although higher resolution data is incorporated in most of the map, the resolution of the combined output will be limited by the lower resolution data.

Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Douglas M. Morton
Contact_Organization: U.S. Geological Survey, Western Region, Earth Surface Processes Team
Contact_Position: Project geologist
Contact_Address:
Address_Type: mailing address
Address: U.S. Geological Survey
Address: Department of Earth Sciences
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State_or_Province: California
Postal_Code: 92521
Country: United States of America
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Contact_Facsimile_Telephone: (909) 276-6295
Contact_Electronic_Mail_Address: scamp@usgs.gov

Data_Set_Credit: Geologic mapping and digital preparation of this report were sponsored jointly by (1) the National Cooperative Geologic Mapping Program of the U.S. Geological Survey, (2) the California Division of Mines and Geology, (3) the Southern California Areal Mapping Project (SCAMP), and (4) the U.S. Air Force.

Native_Data_Set_Environment:
SunOS, 5.8, sun4m UNIX
ARC/INFO version 7.2.1
Cross_Reference:
Citation_Information:
Originator: Morton, D.M.
Publication_Date: 1999
Title: Preliminary digital geologic map of the Santa Ana 30'x60' quadrangle, southern California, version 1.0.
Geospatial_Data_Presentation_Form: vector digital data
Series_Information:
Series_Name: U.S. Geological Survey Open-File Report
Issue_Identification: USGS OF 99-172
Publication_Information:
Publication_Place: California
Publisher: U.S. Geological Survey
Online_Linkage: http://geopubs.wr.usgs.gov/open-file/of99-172

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
Geologic-map units in the Sunnymead quadrangle database were described using standard field methods. Consistent with these methods, the database author has assigned standard geologic attributes to geologic lines, points, and polygons identified in the database.
Nation-wide geologic-map accuracy standards have not been developed and adopted by the U.S. Geological Survey and other earth-science entities. Until such standards are adopted, the SCAMP project has developed internal map-accuracy standards for 1:24,000-scale geologic maps produced by the project. Geologic lines and points on 1:24,000 scale geologic maps are judged to meet SCAMP's internal map-accuracy standards if they are located to within +/-15 meters, relative to topographic or cultural features on the base map. On any derivative geologic-map plot, line data that are judged to meet the SCAMP internal map-accuracy standard are denoted by solid lines; line data that may not meet the SCAMP internal map-accuracy standard are denoted by dashed or dotted lines. There is no cartographic device for denoting the map-accuracy for geologic-point data (e.g., symbols representing bedding, foliation, lineations, etc.).
Logical_Consistency_Report:
Polygon and chain-node topology present.
The areal extent of the map is represented digitally by an appropriately projected (polyconic projection), mathematically generated box. Consequently, polygons intersecting the lines that comprise the map boundary are closed by that boundary. Polygons internal to the map boundary are completely enclosed by line segments which are themselves a set of sequentially numbered coordinate pairs. Point data are represented by coordinate pairs.
Completeness_Report: The geologic map database of the Sunnymead 7.5' quadrangle contains new data that have been subjected to rigorous review and are a substantially complete representation of the current state of knowledge concerning the geology of the quadrangle.
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: The maximum transformation RMS error acceptable for a 7.5' quadrangle transformation and data input is 0.003 (1.8 meters). Horizontal positional accuracy was checked by visual comparison of hard-copy plots with base-stable source data.
Lineage:
Process_Step:

Process_Description: Field mapping and aerial photograph interpretation; iterative process (D.M. Morton).
Process_Date: 1978, 1996-97
Process_Step:
Process_Description: Field mapping and aerial photograph interpretation; iterative process (J.C. Matti).
Process_Date: 1988, 1997
Process_Step:
Process_Description: Digitization of geologic linework and point data from a scale-stable cartographic base of quadrangle. ARC/INFO database established; cleanup of artifacts; polygon, arc, and point attribute tables established. Digitizing and editing artifacts significant enough to display at a scale of 1:24,000 were corrected (V.M. Diep and U. Edwards-Howells).
Process_Date: 1999-2001
Process_Step:
Process_Description: Description of map units and correlation of map units (F.K. Miller).
Process_Date: 2001
Process_Step:
Process_Description:
First draft of metadata created by Michael J. Watson using
FGDCMETA.AML ver. 1.2 05/14/98 on ARC/INFO data set
/scamp26/mwatson/sun_ofr/sun_geo
Process_Date: 20011003

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Point
Point_and_Vector_Object_Count: 440
SDTS_Point_and_Vector_Object_Type: String
Point_and_Vector_Object_Count: 1261
SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
Point_and_Vector_Object_Count: 441

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Map_Projection:
Map_Projection_Name: Polyconic
Polyconic:
Latitude_of_True_Scale: 33.875
Longitude_of_Central_Meridian: -117.1875
False_Easting: 0.00000
False_Northing: 0.00000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: coordinate pair
Coordinate_Representation:
Abscissa_Resolution: 1.000396490097
Ordinate_Resolution: 1.000396490097
Planar_Distance_Units: Meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1927
Ellipsoid_Name: Clarke 1866
Semi-major_Axis: 6378206.4
Denominator_of_Flattening_Ratio: 294.98

Entity_and_Attribute_Information:

Overview_Description:
Entity_and_Attribute_Overview:
Version 1.0 of the Sunnymead 7.5' quadrangle comprises three ARC/INFO coverages, of which two contain geologic data, and one contains cartographic features: sun_geo (geology), sun_str (structural data), and sun_ano (annotation and leaders).

Geologic data represented by line entities and the polygons they delineate are contained in the coverage SUN_GEO. For display purposes, the annotation coverage contains one annotation subclass: anno.geo contains unit labels.

Geological point data includes site-specific information describing the types and the orientation of bedding, foliation, and lineations. Annotation is respective dip and plunge values associated with individual point data.

```
>
>SUN_GEO.PAT:
>
>COLUMN   ITEM NAME       WIDTH OUTPUT  TYPE N.DEC  ALTERNATE NAME
>   1  AREA              4    12     F      3
>   5  PERIMETER         4    12     F      3
>   9  SUN_GEO#          4    5      B      -
>  13  SUN_GEO-ID        4    5      B      -
>  17  LABL              35   35     C      -
>  52  PLABL             35   35     C      -
>  87  SHD               3    3      I      -
>  90  SHDFIL            3    3      I      -
>  93  NAME              200  200    C      -
>
>
>SUN_GEO.AAT:
>
>COLUMN   ITEM NAME       WIDTH OUTPUT  TYPE N.DEC  ALTERNATE NAME
>   1  FNODE#            4    5      B      -
>   5  TNODE#            4    5      B      -
>   9  LPOLY#            4    5      B      -
>  13  RPOLY#            4    5      B      -
>  17  LENGTH            4    12     F      3
>  21  SUN_GEO#          4    5      B      -
>  25  SUN_GEO-ID        4    5      B      -
>  29  LTYPE             35   35     C      -
>  64  L-SYMB            3    3      I      -
>
>
```

Entity_and_Attribute_Detail_Citation: none

Detailed_Description:
Entity_Type:
Entity_Type_Label: sun_geo.pat
Entity_Type_Definition: Geologic units (LABL) and their corresponding names (NAME) identified in the Sunnymead 7.5' quadrangle

Attribute:
Attribute_Label: LABL
Attribute_Definition: geologic map unit label, in plain text
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: Kbft
Enumerated_Domain_Value_Definition: Biotite-hornblende tonalite of Box Springs plutonic complex

Enumerated_Domain:
Enumerated_Domain_Value: Kbg
Enumerated_Domain_Value_Definition: Porphyritic granodiorite of Box Springs plutonic complex
Enumerated_Domain:
Enumerated_Domain_Value: Kbhg
Enumerated_Domain_Value_Definition: Heterogeneous porphyritic granodiorite of Box Springs plutonic complex
Enumerated_Domain:
Enumerated_Domain_Value: Kg
Enumerated_Domain_Value_Definition: Granitic dikes
Enumerated_Domain:
Enumerated_Domain_Value: Kgu
Enumerated_Domain_Value_Definition: Granite, undifferentiated
Enumerated_Domain:
Enumerated_Domain_Value: Khg
Enumerated_Domain_Value_Definition: Heterogeneous granitic rocks
Enumerated_Domain:
Enumerated_Domain_Value: Kqd
Enumerated_Domain_Value_Definition: Quartz diorite, undifferentiated
Enumerated_Domain:
Enumerated_Domain_Value: Kt
Enumerated_Domain_Value_Definition: Tonalite, undifferentiated
Enumerated_Domain:
Enumerated_Domain_Value: Ktm
Enumerated_Domain_Value_Definition: Tonalite and mafic rocks, undifferentiated
Enumerated_Domain:
Enumerated_Domain_Value: Pzs
Enumerated_Domain_Value_Definition: Biotite schist
Enumerated_Domain:
Enumerated_Domain_Value: QTstc
Enumerated_Domain_Value_Definition: Quartzite-bearing conglomerate beds of San Timoteo beds of Frick (1921)
Enumerated_Domain:
Enumerated_Domain_Value: QTsts
Enumerated_Domain_Value_Definition: Conglomeratic sandstone beds of San Timoteo beds of Frick (1921)
Enumerated_Domain:
Enumerated_Domain_Value: QTstu
Enumerated_Domain_Value_Definition: Upper member of San Timoteo beds of Frick (1921)
Enumerated_Domain:
Enumerated_Domain_Value: Qa
Enumerated_Domain_Value_Definition: Axial channel deposits
Enumerated_Domain:
Enumerated_Domain_Value: Qaf
Enumerated_Domain_Value_Definition: Artificial fill
Enumerated_Domain:
Enumerated_Domain_Value: Qfag
Enumerated_Domain_Value_Definition: Alluvial fan deposits, arenaceous gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qls
Enumerated_Domain_Value_Definition: Landslide deposits
Enumerated_Domain:
Enumerated_Domain_Value: Qofa
Enumerated_Domain_Value_Definition: Old alluvial fan deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qofag

Enumerated_Domain_Value_Definition: Old alluvial fan deposits, arenaceous gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qols
Enumerated_Domain_Value_Definition: Old landslide deposits
Enumerated_Domain:
Enumerated_Domain_Value: Qvof1a
Enumerated_Domain_Value_Definition: Very old alluvial fan deposits, unit 1, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qvofa
Enumerated_Domain_Value_Definition: Very old alluvial fan deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qvols
Enumerated_Domain_Value_Definition: Very old landslide deposits
Enumerated_Domain:
Enumerated_Domain_Value: Qwag
Enumerated_Domain_Value_Definition: Wash deposits, arenaceous gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qyaa
Enumerated_Domain_Value_Definition: Young axial channel deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qyaag
Enumerated_Domain_Value_Definition: Young axial channel deposits, arenaceous gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qyfa
Enumerated_Domain_Value_Definition: Young alluvial fan deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qyfag
Enumerated_Domain_Value_Definition: Young alluvial fan deposits, arenaceous gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qyls
Enumerated_Domain_Value_Definition: Young landslide deposits
Enumerated_Domain:
Enumerated_Domain_Value: Qyva
Enumerated_Domain_Value_Definition: Young alluvial valley deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qyvsa
Enumerated_Domain_Value_Definition: Young alluvial valley deposits, silt arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qywa
Enumerated_Domain_Value_Definition: Young wash deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qywag
Enumerated_Domain_Value_Definition: Young wash deposits, arenaceous gravel
Enumerated_Domain:
Enumerated_Domain_Value: Tstd
Enumerated_Domain_Value_Definition: Middle member conglomerate of San Timoteo beds of Frick (1921)
Enumerated_Domain:
Enumerated_Domain_Value: Tstm
Enumerated_Domain_Value_Definition: Middle member of San Timoteo beds of Frick (1921)
Attribute:
Attribute_Label: PLABL
Attribute_Definition: Geological map unit label used to generate plot labels with relevant stratigraphic symbols. The geologic units with LABL designating Mesozoic (Mz) have keystroke substitute characters, }, that call their corresponding symbols from the Stratagem Font Group. Geologic map unit labels will plot

on derivative map plots with appropriate stratigraphic symbols if PLABL is used as the source for unit labels.
Attribute:
Attribute_Label: SHD
Attribute_Definition: polygon color (as integer value) from shadeset alc1.shd (included in the symbols package)
Attribute:
Attribute_Label: SHDFIL
Attribute_Definition: polygon fill pattern (as integer value) from shadeset geology2.shd (included in the symbols package)
Attribute:
Attribute_Label: NAME
Attribute_Definition: Geologic name of map unit (see list under LABL attribute)
Detailed_Description:
Entity_Type:
Entity_Type_Label: sun_geo.aat
Entity_Type_Definition: Geologic features such as contacts and faults that bound rock-unit polygons
Attribute:
Attribute_Label: LTYPE
Attribute_Definition: Description of types of lines on the geologic map (contact, fault).
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: contact, certain
Enumerated_Domain_Value: fault, certain
Enumerated_Domain_Value: fault, approx. located
Enumerated_Domain_Value: fault, concealed
Enumerated_Domain_Value: fault, queried
Enumerated_Domain_Value: fault, approx. located, queried
Enumerated_Domain_Value: Kg, granitic dike
Enumerated_Domain_Value: map boundary
Attribute:
Attribute_Label: L-SYMB
Attribute_Definition: stores appropriate line symbol value from the lineset geoscamp2.lin
Detailed_Description:
Entity_Type:
Entity_Type_Label: sun_str.pat
Entity_Type_Definition: Geological point data includes site-specific information describing the types and the orientation of bedding, foliation, and lineations. One annotation subclass is included in the geologic points coverage, SUN_STR which displays the respective dip and plunge values associated with individual point data.
Attribute:
Attribute_Label: PTTYPE
Attribute_Definition: describes type of point data (bedding, horizontal bedding, foliation)
Attribute:
Attribute_Label: P-SYMB
Attribute_Definition: Coded integer value that relates point to cartographic point symbol in markerset geoscamp2.mrk
Attribute:
Attribute_Label: STRIKE
Attribute_Definition: Azimuthal strike of planar feature
Attribute:
Attribute_Label: DIP
Attribute_Definition: Dip of planar feature
Detailed_Description:
Entity_Type:
Entity_Type_Label: sun_ano.aat

Entity_Type_Definition: Annotation leaders
Attribute:
Attribute_Label: L-SYMB
Attribute_Definition: Coded integer value (1) that relates arcs to cartographic line symbol in lineset geoscamp2.lin

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Metadata_Date: 20011003
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Metadata_Standard_Version: Version of June 8, 1994
Metadata_Access_Constraints: none
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