GEOLOGIC MAP OF THE LAKE MATHEWS 7.5' QUADRANGLE, RIVERSIDE COUNTY, CALIFORNIA

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Prepared in cooperation with
CALIFORNIA DIVISION OF MINES AND GEOLOGY

Open-File Report OF 01-479

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

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TABLE OF CONTENTS

INTRODUCTION

General

Open-File Report 01-479 contains a digital geologic map database of the Lake Mathews 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 lkm_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/01-479 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 lkm.tar.gz (1.9 Mb); see section below titled, SOFTWARE UTILITES.

ARC/INFO interchange files	Lake Mathews coverages	Contains
lkm_geo.e00	lkm_geo	Contacts, faults, geologic unit labels
lkm_ano.e00	lkm_ano	Annotation subclasses: GEO (for plotting unit labels)
lkm_str.e00	lkm_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 lkm (Lake Mathews) info/ directory contains:

Feature Attribute Tables

Polygon attribute table	lkm_geo.pat
Arc attribute table	lkm_geo.aat lkm_ano.aat
Point attribute table	lkm_str.pat

Raster file	Resultant image	Contains
lkm.tif	Lake Mathews base map	Topographic base from 500 dpi scan of USGS Lake Mathews 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
lkm_map.ps.gz	lkm_map.ps	PostScript plot file of geologic map and CMU/DMU

The PostScript file is compressed using WinZip.

The uncompressed PostScript file lkm_map.ps will plot a 1:24,000 scale, full color geologic map of the Lake Mathews 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
lkm_map.pdf	Postscript plot file of geologic map and CMU/DMU

SOFTWARE UTILITIES

Files which have .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 is 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/of01-479 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, lkm/, that will contain the ARC/INFO interchange files and supporting files. The directory should contain the following files:

lkm/

- lkm_geo.e00
- lkm_str.e00
- lkm_ano.e00

- lkm.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 or the symbols tar file, and are downloaded separately.

- lkm_map.ps.gz
- README.pdf
- lkm_map.pdf

Postscript plot files

Make a 14.4 MB uncompressed file, lkm_map.ps (plot of complete map), by typing gzip -d lkm_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 (lkm.tif) was prepared by scanning a scale-stable clear film of the U.S. Geological Survey, 1:24,000 Lake Mathews 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 Lake Mathews 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 (Southern California Areal Mapping Project) 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 26 15.000 longitude of central meridian
	33 45 0.00 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 lkm_map.pdf or the Postscript map plot, lkm_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: F. Harold Weber, Jr.
Publication_Date: 2001
Title: Geologic Map of the Lake Mathews 7.5' Quadrangle, Riverside County, California
Edition: 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 01-479
Publication_Information:
Publication_Place: Menlo Park, California
Publisher: U.S. Geological Survey
Online_Linkage: http://geopubs.wr.usgs.gov/open-file/of01-479

Description:

Abstract:
This data set maps and describes the geology of the Lake Mathews 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.

All but the southeast corner of the Lake Mathews quadrangle is in the Perris block, a relatively stable, rectangular-in-plan area located between the Elsinore and San Jacinto fault zones in the northern Peninsular Ranges Province. In the southwest corner of the quadrangle, a small triangular-shaped area that is part of the Santa Ana Mountains structural block is separated from the Perris block by a short segment of the Elsinore fault zone. The active Elsinore fault zone, a major component of the San Andreas fault system, consists of a series of en echelon northwest-striking right lateral faults located in a graben-like structure.

There is limited relief within the quadrangle because of the presence of two prominent erosion surfaces. The lower Perris surface (about 1,500 feet elevation) has low relief and dominates the physiography of the northern half of the quadrangle. This surface is discontinuously covered by coarse-grained, clastic, non-marine sedimentary rocks of the middle Miocene-age Lake Mathews Formation. A higher Gavilan-

Lakeview surface (about 2,100 feet elevation) occurs in the eastern part of the quadrangle, and is locally covered by small exposures of fluvial conglomerate that contain exotic clasts of red rhyolite.

The Lake Mathews quadrangle is underlain almost entirely by Cretaceous and older basement rocks. Two different types of metamorphic rocks are exposed in the quadrangle. In the northeast is a northwest trending exposure of amphibolite grade biotite-bearing schist of probable Mesozoic age. This schist separates massive textured granitic rocks to the west from foliated and layered granitic rocks to the east. The large expanse of metamorphic rock between Temescal Wash and Lake Mathews is low metamorphic grade, typically siliceous, but highly variable in composition.

Cretaceous plutonic rocks in the quadrangle are part of the composite Peninsular Ranges batholith, and represent a wide variety of mafic to intermediate composition granitic rocks. Most are massive-textured with the exception of the crudely foliated biotite-hornblende tonalite of the Val Verde pluton in the northeast corner of the quadrangle. The Cajalco pluton, which consists of biotite monzogranite, granodiorite and lesser amounts of biotite-hornblende granodiorite, by far, accounts for most of the granitic rocks in the quadrangle. It is a shallow level pluton emplaced by magmatic stoping into largely intermediate composition volcanic and volcanoclastic rocks and metamorphic rocks in its western and southern extent and into gabbroic rocks in its northern extent. The pluton appears to be tilted up to the northeast with the texture of the rock changing from subporphyritic rock containing beta-quartz-appearing phenocrysts in the southwestern part of the pluton to coarser-grained hypautomorphic texture rock in the eastern part. Located in the upper part of the pluton and in overlying wall rock in the shallow western part of the pluton is widespread metasomatic tourmaline rock. Locally parts of the pluton have been completely replaced by tourmaline but more commonly tourmaline occurs in discrete thin zones, generally along joints. Some of the larger masses of tourmaline rock, locally termed tourmaline 'blowouts', contain cassiterite and sulfides. One large mass of cassiterite-bearing tourmaline rock supported a tin mining and smelting operation.

In the southeast corner of the quadrangle is the northwest part of the Gavilan ring complex. This shallow plutonic complex centered southeast of the quadrangle is predominantly tonalitic composition, characterized by the presence of hypersthene, which is rarely found in Peninsular Ranges batholithic rocks of intermediate composition.

Most of the southern part of the quadrangle is underlain by siliceous volcanic and volcanoclastic rocks considered to be coeval with the batholith and which are considered to represent the supra-part of the batholithic magmatism. These rocks generally range in composition from rhyolite to andesite, but latite is probably the predominant composition.

Paleocene continental rocks of the Silverado Formation occur within the Elsinore fault zone and nearby on the adjacent Perris block. Clay-rich parts of the Silverado Formation have been mined for industrial clay. Near Arlington Mountain, in the northwest part of the quadrangle, are two very small occurrences of conglomerate that consist of exotic welded-tuff clasts and a few exotic bedded quartzite clasts. Extensive Quaternary alluvial deposits are found along the south side of Lake Mathews and in the Temescal Valley along the Elsinore fault zone.

Purpose: The data set for the Lake Mathews 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: -117.5000909
East_Bounding_Coordinate: -117.37490912
North_Bounding_Coordinate: 33.87500019
South_Bounding_Coordinate: 33.74997833

Keywords:
Theme:
Theme_Keyword_Thesaurus: none
Theme_Keyword: geologic map
Theme_Keyword: geology
Theme_Keyword: bedrock geology
Theme_Keyword: alluvial geology
Place:
Place_Keyword_Thesaurus: none
Place_Keyword: California
Place_Keyword: Riverside County
Place_Keyword: Lake Mathews 7.5' quadrangle
Stratum:
Stratum_Keyword_Thesaurus: none
Stratum_Keyword: Cretaceous tonalite and granodiorite
Stratum_Keyword: Quaternary deposits
Temporal:
Temporal_Keyword_Thesaurus: none
Temporal_Keyword: Cretaceous
Temporal_Keyword: Quaternary
Access_Constraints: none

Use_Constraints:
The Lake Mathews 7.5' geologic-map database should be used to evaluate and understand the geologic character of the Lake Mathews 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
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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, and (3) the Southern California Areal Mapping Project (SCAMP).
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 Lake Mathews 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, lineation, 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 Lake Mathews 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: 1993-95

Process_Step:
Process_Description: Field mapping (F.H. Weber, Jr.).
Process_Date: 1976

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: Revision of description of map units and correlation of map units (Kelly Corriea).
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/lkm_ofr/lkm_geo
Process_Date: 20011207

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: 281
SDTS_Point_and_Vector_Object_Type: String
Point_and_Vector_Object_Count: 703
SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
Point_and_Vector_Object_Count: 282

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:

Map_Projection:
Map_Projection_Name: Polyconic
Polyconic:
Latitude_of_True_Scale: 33.75
Longitude_of_Central_Meridian: -117.4375
False_Easting: 0.00000
False_Northing: 0.00000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: coordinate pair
Coordinate_Representation:
Abscissa_Resolution: 1.000373721122
Ordinate_Resolution: 1.000373721122
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 Lake Mathews 7.5' quadrangle comprises three ARC/INFO coverages, of which two contain geologic data, and one contains cartographic features: lkm_geo (geology), lkm_str (structural data), and lkm_ano (annotation and leaders).

Geologic data represented by line entities and the polygons they delineate are contained in the coverage LKM_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.

>
>LKM_GEO.PAT:
>
>COLUMN ITEM NAME WIDTH OUTPUT TYPE N.DEC ALTERNATE NAME
> 1 AREA 8 18 F 5
> 9 PERIMETER 8 18 F 5
> 17 LKM_GEO# 4 5 B -
> 21 LKM_GEO-ID 4 5 B -
> 25 LABL 35 35 C -
> 60 PLABL 35 35 C -
> 95 SHD 3 3 I -
> 98 SHDFIL 3 3 I -
> 101 NAME 200 200 C -
>
>
>LKM_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 8 18 F 5
> 25 LKM_GEO# 4 5 B -
> 29 LKM_GEO-ID 4 5 B -

> 33 LTYPE 60 60 C -
> 93 L-SYMB 3 3 I -
>
>
Entity_and_Attribute_Detail_Citation: none

Detailed_Description:
Entity_Type:
Entity_Type_Label: lkm_geo.pat
Entity_Type_Definition: Geologic units (LABL) and their corresponding names (NAME) identified in the Lake Mathews 7.5' quadrangle
Attribute:
Attribute_Label: LABL
Attribute_Definition: geologic map unit label, in plain text
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: Kcg
Enumerated_Domain_Value_Definition: Monzogranite of Cajalco pluton
Enumerated_Domain:
Enumerated_Domain_Value: Kcgb
Enumerated_Domain_Value_Definition: Granodiorite and gabbro, undifferentiated of Cajalco pluton
Enumerated_Domain:
Enumerated_Domain_Value: Kcgd
Enumerated_Domain_Value_Definition: Granodiorite of Cajalco pluton
Enumerated_Domain:
Enumerated_Domain_Value: Kcgq
Enumerated_Domain_Value_Definition: Granodiorite and quartz latite, undifferentiated of Cajalco pluton
Enumerated_Domain:
Enumerated_Domain_Value: Kct
Enumerated_Domain_Value_Definition: Tonalite of Cajalco pluton
Enumerated_Domain:
Enumerated_Domain_Value: Kcto
Enumerated_Domain_Value_Definition: Tourmalinized monzogranite and granodiorite
Enumerated_Domain:
Enumerated_Domain_Value: Kgb
Enumerated_Domain_Value_Definition: Gabbro
Enumerated_Domain:
Enumerated_Domain_Value: Kgt
Enumerated_Domain_Value_Definition: Massive textured tonalite of Gavilan ring complex
Enumerated_Domain:
Enumerated_Domain_Value: Kgtf
Enumerated_Domain_Value_Definition: Foliated tonalite of Gavilan ring complex
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: Kt
Enumerated_Domain_Value_Definition: Tonalite, undifferentiated
Enumerated_Domain:
Enumerated_Domain_Value: Kvem
Enumerated_Domain_Value_Definition: Estelle Mountain volcanics of Herzig (1991)
Enumerated_Domain:

Enumerated_Domain_Value: Kvr
Enumerated_Domain_Value_Definition: Rhyolite of Estelle Mountain volcanics of Herzig (1991)
Enumerated_Domain:
Enumerated_Domain_Value: Kvs
Enumerated_Domain_Value_Definition: Intermixed Estelle Mountain volcanics of Herzig (1991) and sedimentary rocks
Enumerated_Domain:
Enumerated_Domain_Value: Kvspi
Enumerated_Domain_Value_Definition: Intrusive rocks associated with Santiago Peak Volcanics
Enumerated_Domain:
Enumerated_Domain_Value: Kvt
Enumerated_Domain_Value_Definition: Tonalite of Val Verde pluton
Enumerated_Domain:
Enumerated_Domain_Value: Lake Mathews
Enumerated_Domain_Value_Definition: Lake Mathews
Enumerated_Domain:
Enumerated_Domain_Value: Mzs
Enumerated_Domain_Value_Definition: Schist
Enumerated_Domain:
Enumerated_Domain_Value: Mzu
Enumerated_Domain_Value_Definition: Mesozoic metasedimentary rocks, undifferentiated
Enumerated_Domain:
Enumerated_Domain_Value: QTt
Enumerated_Domain_Value_Definition: Conglomerate of Temescal Wash
Enumerated_Domain:
Enumerated_Domain_Value: Qaf
Enumerated_Domain_Value_Definition: Artificial fill
Enumerated_Domain:
Enumerated_Domain_Value: Qoa
Enumerated_Domain_Value_Definition: Old axial channel deposits
Enumerated_Domain:
Enumerated_Domain_Value: Qoaa
Enumerated_Domain_Value_Definition: Old axial channel deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qoag
Enumerated_Domain_Value_Definition: Old axial channel deposits, gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qof
Enumerated_Domain_Value_Definition: Old alluvial fan deposits
Enumerated_Domain:
Enumerated_Domain_Value: Qofa
Enumerated_Domain_Value_Definition: Old alluvial fan deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qofg
Enumerated_Domain_Value_Definition: Old alluvial fan deposits, gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qova
Enumerated_Domain_Value_Definition: Old alluvial valley deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qvoa
Enumerated_Domain_Value_Definition: Very old axial channel deposits
Enumerated_Domain:
Enumerated_Domain_Value: Qvoag
Enumerated_Domain_Value_Definition: Very old axial channel deposits, gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qvof1g

Enumerated_Domain_Value_Definition: Very old alluvial fan deposits, unit 1, gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qvofa
Enumerated_Domain_Value_Definition: Very old alluvial fan deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qvofg
Enumerated_Domain_Value_Definition: Very old alluvial fan deposits, gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qyaa
Enumerated_Domain_Value_Definition: Young axial channel deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qyag
Enumerated_Domain_Value_Definition: Young axial channel deposits, gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qyf
Enumerated_Domain_Value_Definition: Young alluvial fan deposits
Enumerated_Domain:
Enumerated_Domain_Value: Qyfa
Enumerated_Domain_Value_Definition: Young alluvial fan deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Qyfg
Enumerated_Domain_Value_Definition: Young alluvial fan deposits, gravel
Enumerated_Domain:
Enumerated_Domain_Value: Qyva
Enumerated_Domain_Value_Definition: Young alluvial valley deposits, arenaceous
Enumerated_Domain:
Enumerated_Domain_Value: Tcga
Enumerated_Domain_Value_Definition: Conglomerate of Arlington Mountain
Enumerated_Domain:
Enumerated_Domain_Value: Tcgr
Enumerated_Domain_Value_Definition: Rhyolite-clast conglomerate of Lake Mathews area
Enumerated_Domain:
Enumerated_Domain_Value: Tlm
Enumerated_Domain_Value_Definition: Lake Mathews Formation
Enumerated_Domain:
Enumerated_Domain_Value: Tlm?
Enumerated_Domain_Value_Definition: Lake Mathews Formation
Enumerated_Domain:
Enumerated_Domain_Value: Tsi
Enumerated_Domain_Value_Definition: Silverado Formation
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 a keystroke substitute character, }, that calls their corresponding symbols from the Geoage 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
Attribute:
Attribute_Label: SHDFIL
Attribute_Definition: polygon fill pattern (as integer value) from shadeset geology2.shd
Attribute:
Attribute_Label: NAME
Attribute_Definition: Geologic name of map unit (see list under LABL attribute)

Detailed_Description:
Entity_Type:
Entity_Type_Label: lkm_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: Kcto, zone of tourmalinized monzogranite and granodiorite
Enumerated_Domain_Value: contact, certain
Enumerated_Domain_Value: fault, approx. located
Enumerated_Domain_Value: fault, certain
Enumerated_Domain_Value: fault, concealed
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: lkm_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, LKM_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: lkm_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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This digital geologic map database of the Lake Mathews 7.5' quadrangle, 1:24,000 map-scale, and any derivative maps thereof, is not meant to be used or displayed at any scale larger than 1:24,000 (e.g., 1:12,000).

Metadata_Reference_Information:
Metadata_Date: 20011207
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Metadata_Contact:
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Metadata_Standard_Version: Version of June 8, 1994
Metadata_Access_Constraints: none
Metadata_Use_Constraints: none