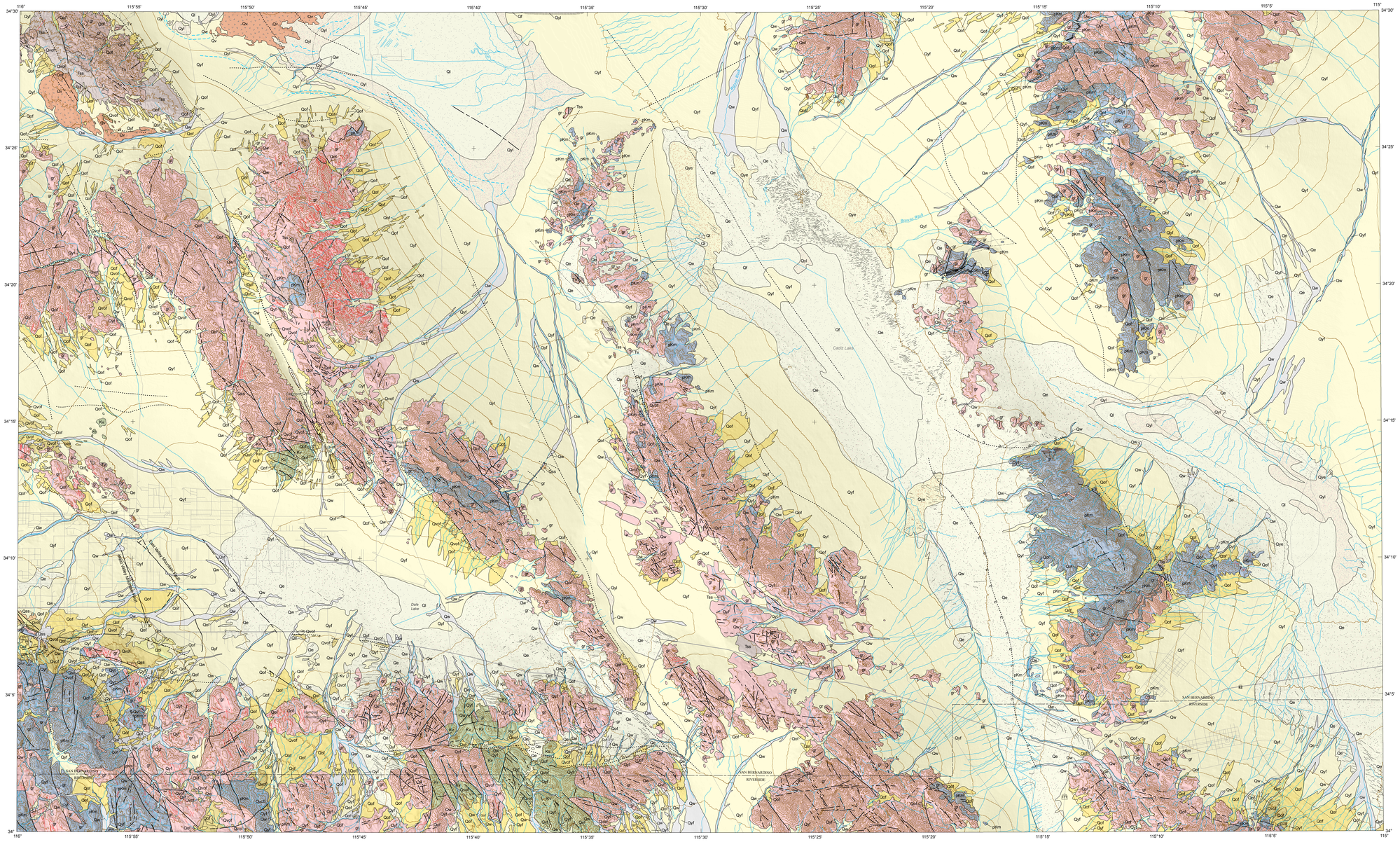


Projection: Universal Transverse Mercator, Zone 11 North, North American Datum of 1983.

Topographic contours derived from USGS 1/3 arc-second National Elevation Dataset (NED). Shaded topographic relief derived from USGS 1/3 arc-second NED. Base map of hydrography from National Hydrography Dataset Plus (NHDPlus) and California Department of Fish and Game. Base map of geographic names from USGS Geographic Names Information System (GNIS).

APPROXIMATE MEAN DECLINATION, 2010

MAP LOCATION

SCALE 1:100 000

5 2.5 0 5 MILES

5000 0 5000 10000 15000 20000 25000 30000 35000 40000 45000 50000 FEET

5 2.5 0 5 10 KILOMETERS

5000 0 5000 10000 METERS

CONTOUR INTERVAL 50 METERS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

MAP UNITS

Late Holocene (Surficial Deposits)

Qw — **Alluvial Wash Deposits** - unconsolidated sandy and gravelly sediment deposited in recently active channels of streams and rivers; may contain loose to moderately loose sand and silty sand

Ql — **Lacustrine, Playa, and Estuarine (Paralic) Deposits** - mostly unconsolidated fine-grained sand, silt, mud, and clay from fresh water (lacustrine) lakes, saline (playa) dry lakes that are periodically flooded, and estuaries; deposits may contain salt and other evaporites

Qe — **Eolian and Dune Deposits** - unconsolidated, generally well-sorted wind-blown sand; may occur as dune forms or sheet sand

Holocene to Late Pleistocene (Surficial Deposits)

Qyf — **Young Alluvial Fan Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon

Qyl — **Young Lacustrine, Playa, and Estuarine (Paralic) Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected fine-grained sand, silt, mud and clay from lake, playa, and estuarine deposits of various types

Qye — **Young Eolian and Dune Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected wind-blown sands

Late to Middle Pleistocene (Surficial Deposits)

Qof — **Old Alluvial Fan Deposits** - slightly to moderately consolidated, moderately dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon

Qol — **Old Lacustrine, Playa, and Estuarine (Paralic) Deposits** - slightly to moderately consolidated, moderately dissected fine-grained sand, silt, mud, and clay from lake, playa, and estuarine deposits of various types

Middle to Early Pleistocene (Surficial Deposits)

Qvof — **Very Old Alluvial Fan Deposits** - moderately to well-consolidated, highly dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon

Quaternary (Bedrock)

Qss — **Coarse-grained formations of Pleistocene age and younger** - primarily sandstone and conglomerate

Qv — **Pleistocene age and younger formations of volcanic origin**

Tertiary (Bedrock)

Tss — **Coarse-grained Tertiary age formations** - primarily sandstone and conglomerate

Tv — **Tertiary age formations of volcanic origin**

Mesozoic and Older (Bedrock)

Ksh — **Fine-grained Cretaceous age formations of sedimentary origin**

Kv — **Cretaceous age formations of volcanic origin**

pKm — **Cretaceous and pre-Cretaceous metamorphic formations of sedimentary and volcanic origin**

gr — **Granitic and other intrusive crystalline rocks of all ages**

SYMBOL EXPLANATION

[For geologic line symbols: lines are solid where location is accurate, long-dashed where location is approximate, short-dashed where location is inferred, dotted where location is concealed. Queries added where identity or existence may be questionable.]

Contacts

- Contact
- Gradational contact
- Reference contact -- Used to delineate geologic units that were mapped as separate units on the original source map, but are consolidated on this map.
- Fault -- Includes strike-slip, normal, reverse, oblique, thrust and unspecified slip
- Lineament
- Dune crest
- Dike
- Former shoreline or marine limit
- Stream
- Spring
- Road
- County boundary

GEOLOGIC COMPILATION OF QUATERNARY SURFICIAL DEPOSITS IN SOUTHERN CALIFORNIA
SHEEP HOLE MOUNTAINS 30' X 60' QUADRANGLE

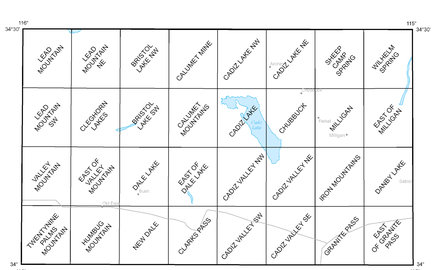
A Project for the Department of Water Resources by the California Geological Survey

Compiled from existing sources by
Cheryl A. Hayhurst, PG and Trinda L. Bedrossian, CEG

Digital preparation by
Solomon McCrea and Jim Thompson

July 2010

INDEX TO USGS 7.5' QUADRANGLES



MAP EXPLANATION

This map of Quaternary surficial deposits in the Sheep Hole Mountains 30' x 60' quadrangle was compiled by the California Geological Survey (CGS) for the Department of Water Resources (DWR) to assist in identifying where flooding and deposition of sediment occurred in the geologically recent past. The focus of this project is on Quaternary (Q) surficial deposits (less than 1.8 million years) on alluvial fans, floodplains, and in basins where such deposits are subject to a number of geologic hazards including flooding, amplification of seismic shaking, liquefaction, and collapsible soils. In general, areas of more recent deposition during Late Holocene time (within the last 500 years) have a greater potential to be areas of future flooding and deposition than those underlain by older surficial deposits.

Project Overview

The Sheep Hole Mountains 30' x 60' quadrangle represents one of several 100,000 scale quadrangles included in the detailed Geographic Information System (GIS) based geologic data set compiled by CGS from recent high resolution geologic mapping available for southern California. The GIS database merges more than 2100 geologic units from source maps published primarily by the U.S. Geological Survey (USGS) and by CGS (Source GIS Database) into a common format that depicts 40 derivative categories of surficial deposits and bedrock for the entire area (Derivative GIS Database). Quaternary surficial deposits are divided into 28 categories modified from the methodology of Matti and Cossette (2007), the Southern California Areal Mapping Project (SCAMP, 2000), and the USGS and California Division of Mines and Geology (2000). While specific variations in age and physical properties exist within units on each source map, CGS retained the basic premise of Matti and Cossette (2007) that surficial deposits within each of the Quaternary derivative map units formed during a particular range of geologic time, have a similar origin, and have generally similar physical properties. Within the 28 derivative units, progressively older surficial deposits are typically better consolidated and more highly dissected by erosion, have more developed and/or eroded soil profiles with stronger degrees of weathering and surface armoring, and occupy a higher topographic position within alluvial fan and floodplain terrains. Geologic bedrock formations from the source geologic maps are divided into 12 categories on the derivative maps, based on age and rock type. CGS rectified inconsistencies along the boundaries of mapped areas to create a seamless Derivative GIS Database, but retained links to the original mapping in the Source GIS Database so that the more detailed basic geologic information can be retrieved. Correlation of equivalent deposits across the whole southern California project area is represented in the GIS table entitled Correlation of Derivative and Source Geologic Map Units.

Sheep Hole Mountains Quadrangle

The Sheep Hole Mountains quadrangle, located in the Mojave Desert Province, is primarily characterized by broad northwest-trending alluvial basins separated by narrow northwest-trending ranges. The nature of the landscape may be a result of the movement and rotation of fault blocks within the basins and ranges (Howard, 2002). Faults throughout the quadrangle form part of the Eastern California Shear Zone, including the Holocene active West Valley Mountain and East Valley Mountain faults in the western part of the quadrangle. Topographic relief in the quadrangle ranges from as low as 165 meters elevation at Cadiz Lake to 1490 meters elevation in the Old Woman Mountains (Howard, 2002). Quaternary surficial deposits, consisting primarily of alluvial fan deposits, playa (dry lake) sediments, and eolian (windblown sand) deposits, underlie more than half of the quadrangle. Older alluvium of Pleistocene age forms partly dissected fans, benches, and terraces along the base of the mountain ranges and occurs as isolated remnants on pediment surfaces at higher elevations. Younger alluvium of Holocene to Pleistocene age form extensive fans and basin deposits. Active alluvial wash channels of latest Holocene age cut through both the older and younger fan deposits and extend onto the basin floors. Playa deposits occupy four large dry lakes and five smaller basins within the map area. Evaporite deposits from the larger dry lakes have yielded commercially produced brine and salt (Howard, 2002). Eolian deposits, reworked from the alluvial and playa deposits, form extensive dune fields and sheets in the eastern half and in the southwest corner of the quadrangle. Many of the dunes are still active, with dune crests aligned in an east to southeast direction. Areas in the vicinity of the active wash channels and playas are likely to experience periodic flooding.

In preparing this derivative map of the Sheep Hole Mountains 30' x 60'quadrangle, CGS used geologic source data compiled in digital format by Howard (2002). CGS retained the boundaries of Quaternary age surficial deposits shown on the source map with very few revisions. Quaternary surficial deposits on the source map are represented on this map by 9 of the 28 generalized project derivative units; boundaries of more detailed source map subdivisions are shown without label within the generalized derivative unit. This indicates more detailed geologic information is available in the Source GIS Database. For example, an area designated Qyl (young lacustrine, playa, and estuarine (paralic) deposits) on this map may have been further divided on the source map to distinguish different depositional surfaces and compositions. Bedrock units identified by Howard (2002) are represented on this map by 8 of the 12 project derivative bedrock units (see Map Units and Correlation of Map Units). Quaternary surficial deposits and geologic formation names originally compiled by Howard (2002) are correlated with derivative categories used by CGS in the Geologic Labels GIS spreadsheet for the Sheep Hole Mountains quadrangle.

This map, along with others in the Geologic Compilation of Quaternary Surficial Deposits in Southern California Derivative GIS Database, is regional in nature and should not be used as a substitute for detailed geologic studies in any specific area. It is intended only for rapid identification of areas subject to previous and potential future flooding and other geologic hazards on alluvial fans and floodplains.

MAP REFERENCES

DIGITAL GEOLOGIC DATA FILE USED IN GIS COMPILATION OF QUATERNARY UNITS

Howard, K.A., 2002, Geologic map of the Sheep Hole Mountains 30' x 60' quadrangle, San Bernardino and Riverside counties, California, http://ngmdb.usgs.gov/Prodesc/proddesc_51545.htm: U.S. Geological Survey, Miscellaneous Field Studies, Map MF-2344, scale 1:100,000.

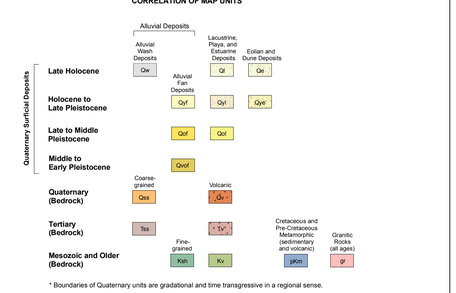
REFERENCES USED IN PREPARING LEGENDS AND MAPS FOR QUATERNARY UNITS

Matti, J. C., and Cossette, P.M., 2007, Classification of surficial materials, Inland Empire Region, southern California: conceptual and operational framework: U.S. Geological Survey, Open-File Report (in progress).

Southern California Areal Mapping Project (SCAMP), 2000, A proposed classification for surficial geologic materials in southern California, version 1.0.

U.S. Geological Survey and California Division of Mines and Geology, 2000, Classification of Quaternary deposits, Southern California Areal Mapping Project (SCAMP), a working model, version 1.0: (09/10/2000).

CORRELATION OF MAP UNITS*



* Boundaries of Quaternary units are gradational and time transgressive in a regional sense.

www.conservation.ca.gov/cgs

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Information on this map is not sufficient to serve as a substitute for the geologic and geotechnical site investigations required under Chapters 7.5 and 7.8 of Division 2 of the California Public Resources Code.