

- MAP UNITS**
- Late Holocene (Surficial Deposits)**
- Artificial Fill** - deposits of fill resulting from human construction, mining, or quarrying activities; includes engineered fill for buildings, roads, dams, airport runways, harbor facilities, and waste landfills.
 - Unconsolidated Surficial Deposits** - include colluvium, alluvium, wash, lake deposits, and other surface deposits of all ages, generally unconsolidated but locally may contain consolidated layers.
 - Landslide Deposits** - may include debris flows and other landslides of various earth and movement types; unconformable to moderately well-consolidated.
 - 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 silt.
 - Alluvial Fan Deposits** - unconsolidated boulders, cobbles, gravel, sand, and silt recently deposited where a fan or stream issues from a confined valley or canyon; sediment typically deposited in a fan-shaped cone; gravely sediment generally more dominant than sandy sediment.
 - Alluvial Valley Deposits** - unconsolidated clay, silt, sand, and gravel recently deposited parallel to localized stream valleys and/or spread more regionally onto alluvial fans of larger river valleys; sandy sediment generally more dominant than gravely sediment.
 - 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 estuarine; clays may contain salt and other evaporites.
 - 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)**
- Young Alluvial Wash Deposits** - unconsolidated to slightly consolidated, undisturbed to slightly dissected sandy and gravely stream bed sediments in marginal parts of active and recently active washes and river channels.
 - Young Alluvial Fan Deposits** - unconsolidated to slightly consolidated, undisturbed to slightly dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon.
 - Young Alluvial Valley Deposits** - unconsolidated to slightly consolidated, undisturbed to slightly dissected clay, silt, sand, and gravel along stream valleys and alluvial fans of larger rivers.
 - Young Lacustrine, Playa, and Estuarine (Paralic) Deposits** - unconsolidated to slightly consolidated, undisturbed to slightly dissected fine-grained sand, silt, mud and clay from lake, playa, and estuarine deposits of various types.
 - Young Eolian and Dune Deposits** - unconsolidated to slightly consolidated, undisturbed to slightly dissected wind-blown sand.
- Late to Middle Pleistocene (Surficial Deposits)**
- Old Alluvial Wash Deposits** - slightly to moderately consolidated, moderately dissected sand and gravel; typically elevated above modern washes.
 - Old Alluvial Fan Deposits** - slightly to moderately consolidated, moderately dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon.
 - Old Alluvial Valley Deposits** - slightly to moderately consolidated, moderately dissected clay, silt, sand, and gravel along stream valleys and alluvial fans of larger rivers.
 - 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.
 - Old Eolian and Dune Deposits** - slightly to moderately consolidated, moderately dissected wind-blown sands.
- Middle to Early Pleistocene (Surficial Deposits)**
- 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.
- Tertiary (Bedrock)**
- Ts** - Coarse-grained Tertiary age formations - primarily sandstone and conglomerate.
 - Tv** - Tertiary age formations of volcanic origin.
- Mesozoic and Older (Bedrock)**
- Mk** - Cretaceous and pre-Cretaceous metamorphic formations of sedimentary and volcanic origin.
 - P** - Granite 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. Curries added where identity of existence may be questionable.]
- Contacts
 - 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.
 - Gradational contact
 - Reference gradational contact
 - Fault - Includes strike-slip, normal, reverse, oblique, and unspecified slip.
 - Lineament
 - Folds - Showing direction of plunge where appropriate.
 - Anticline
 - Stream
 - Spring
 - Road
 - County boundary

CUDEBACK LAKE 30' X 60' QUADRANGLE REVISIONS

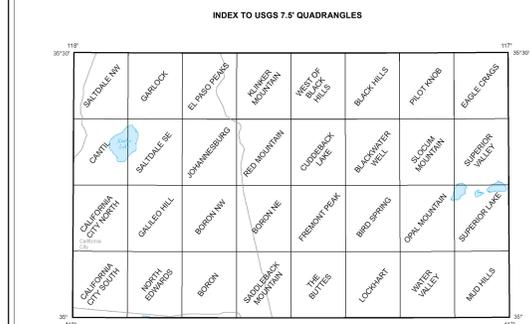
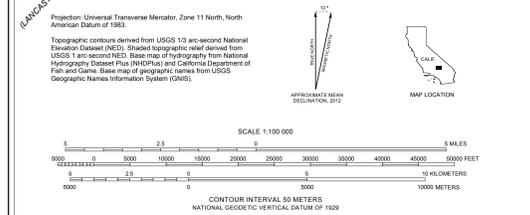
Revisions were made to the Cuddeback Lake 30' x 60' quadrangle based on new mapping along the western edge of the map by Davenport and others (2011). Changes include minor adjustments to unit boundaries. All other geologic map details remain the same as the version of the Cuddeback Lake quadrangle issued in July 2010.

GEOLOGIC COMPILATION OF QUATERNARY SURFICIAL DEPOSITS IN SOUTHERN CALIFORNIA CUDEBACK LAKE 30' X 60' QUADRANGLE

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

Compiled from existing sources by
Trinda L. Bedrossian, CEG

Digital preparation by
Solomon McCrea and Jim Thompson
July 2012



MAP EXPLANATION

This map of Quaternary surficial deposits in the Cuddeback Lake 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 most 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 Cuddeback Lake 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 1400 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 CGS (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 armor, and occupy a higher topographic position within alluvial fan and floodplain terraces. Geologic bedrock formations from the source geologic maps are divided into 12 categories on the derivative maps, based on age and rock type. The bedrock categories can provide a general understanding of the relative erodibility of the upland materials and the general character of the derived sediments. 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.

Cuddeback Lake Quadrangle

The Cuddeback Lake quadrangle is located in the western Mojave Desert within the Basin and Range geomorphic province. Much of the area is low-relief desert that surrounds small mountains, bedrock knolls and hills. Prominent geomorphic features in the area include high-relief mountains, small hills, volcanic domes, pediments (gently sloping erosional surfaces), broad alluvial valleys, and dry lakes (Amoroso and Miller, 2006). The central segment of the Garlock Fault trends northeast through the northern portion of the quadrangle, to the south, the region is subdivided from west to east by discontinuous northwest-trending faults, including the Luchart, Gravel Hills-Harper Lake, and Blackwater faults. Numerous active faults have influential drainage patterns so that most major and minor drainages empty into large playas (dry or ephemeral lakes). Major playas include Koehn Lake within Fremont Valley, Cuddeback Lake south of the Lava Mountains, Harper Lake southwest of the Black Mountains, and Superior Lake northeast of Opal Mountain. Quaternary sediments are the most abundant deposits in the quadrangle. Alluvium and colluvium, derived from the hills and mountains, mantle the hillslopes and streets at the base of the mountains (Amoroso and Miller, 2006). Alluvial fans and terrace deposits of Holocene and Pleistocene age consist of gravel to boulder-size clasts, sand, silt, and clay. Distal ends of the fans grade into fine-grained valley-axis deposits. This veneer of eolian sand is also found downwind from dry lakes and ephemeral drainages. Pediments have formed on granitic bedrock in the east-central, south-central, and western parts of the quadrangle. Active valley-axis deposits and active wash deposits are present west of Cuddeback Lake, in Fremont Valley (northwest of Koehn Lake), in Superior Valley, and in smaller drainages throughout the quadrangle. These areas are prone to channelized flows and flooding during and after heavy rains.

In preparing this derivative map of the Cuddeback Lake 30' x 60' quadrangle, CGS used geologic source data compiled in digital format by Amoroso and Miller (2006). 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 19 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 Qv (young alluvial fan deposits) on this map may have been further divided on the source map into several units to distinguish different depositional surfaces and compositions. Bedrock units identified by Amoroso and Miller (2006) are represented on this map by 4 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 Amoroso and Miller (2006) are correlated with derivative categories used by CGS in the Geologic Labels GIS spreadsheet for the Cuddeback Lake 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

Amoroso, L., and Miller, D.M., 2006. Surficial geologic map and geodatabase of the Cuddeback Lake 30' x 60' quadrangle, San Bernardino and Kern counties, California. U.S. Geological Survey, Open-File Report 2006-1276, scale 1:100,000. <http://ngmdb.usgs.gov/of2006/1276>.

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.

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).

OTHER SELECTED PUBLICATIONS USED AS REFERENCES

Davenport, C.W., Dawson, T.E., Hayden, W.D., and Hayward, C.A., 2011. Geologic map of Quaternary surficial deposits in southern California, Tehachap 30' x 60' quadrangle. California Geological Survey, Special Report 217 (revised 2012), scale 1:100,000.

Jennings, C.W., Burnett, J.L., and Troxel, B.W., 1962. Geologic map of California, Olaf P. Jenkins edition, Trona sheet. California Division of Mines and Geology, scale 1:250,000.

