



**ABBREVIATED EXPLANATION**  
Approximate stratigraphic relationships only; see Map Explanation (Plate 2) for more detailed information

<b>Quaternary</b>	Qa Alluvium	Qd Stream gravel	Qf Flood plain deposits	Qp Basin deposits
Qc Artificial fill	Qe Sand	Qg Canyon fill (softens)	Qh Patterned Alluvium	
Qd Older sand	Qf Older alluvium	Qg Landslide deposits	Qh Marine sediments	Qj San Luis Alluvium
Qk Terrace deposits	Ql Older Dunes Sand	Qm Older canyon fill (softens)	Qn Alluvial fan deposits	Qo Loess Alluvium
Qp Marine terrace deposits	Qq Alluvial fan deposits of Pleistocene terrace	Qr Terrace deposits of Pleistocene terrace	Qs Alluvial fan deposits of Pleistocene terrace	Qt Submarine canyon terrace
<b>Pliocene</b>	Pf Fan deposits of Chualar	Pg Fan deposits of Placencia	Ph Fan deposits of Glenside	Pi Anacostia Sand (undivided)
Pj Bolson facies	Pk Pleistocene continental deposits	Pl Unnamed Pleistocene continental sandstone	Pm Pulcincha Formation	Pn Echelegui Formation
Po Santa Cruz Mudstone	Ps Santa Margarita Sandstone	Pt Monterey Formation	Pu Longpoint Sandstone	Pv Unnamed Miocene sandstone
<b>Miocene</b>	Mw Red beds	Mx Unnamed Miocene volcanic rocks	My Unnamed Miocene sedimentary rocks	Mz Unnamed Miocene sedimentary rocks
<b>Oligocene</b>	Oa Unnamed Eocene sedimentary rocks	Ob San Juan Bautista Formation	Oc Carmelo Formation	Od Los Muertos Formation
<b>Paleocene-Eocene</b>	Pe Tux Pines Sandstone	Pf Arkasic sandstone	Pg Paleocene-Eocene sedimentary rock	Pg Tertiary-Cenozoic sedimentary rock
<b>Cretaceous</b>	Cr Sandstone	Ch Chert	Cg Greenstone	Cs Saponitized andomitic rock
<b>Jurassic</b>	Jb Bluechert and siltstone	Jc Limestone	Jd Gabbro	Jf Hornblende Gabbro of Logan quarry

**SYMBOLS**

Contact: solid where well located; dashed where approximately located or inferred; dotted where concealed; queried where uncertain.

Fault: solid where well located; dashed where approximately located or inferred; dotted where concealed; queried where existence or continuation is uncertain. Arrows show direction of dip when known.

Three fold faults on upper plate: solid where well located; dashed where approximately located or inferred; dotted where concealed; queried where existence or continuation is uncertain. Arrows indicate direction of dip when known.

Anticlinal fold: solid where well located; dashed where inferred; dotted where concealed; queried where existence or continuation is uncertain.

Synclinal fold: solid where well located; dashed where inferred; dotted where concealed; queried where existence or continuation is uncertain.

Strike and dip of stratified rocks. Number indicates dip angle in degrees when known.

Vertical beds

Overturned beds

Horizontal beds

Strike and dip of foliations

Arrows on landslides indicate direction of movement.

Topographic base from U.S. Geological Survey Monterey and Palo Alto 30x60 quadrangles. Shaded topographic base from USGS digital elevation models. Shaded bathymetric base from Monterey Bay Aquarium Research Institute.



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SCALE 1:100,000  
0 2 4 6 Miles  
0 2 4 6 Kilometers  
Contour Interval: 50 meters  
Bathymetric Contour Interval: 500 meters

### GEOLOGIC MAP OF THE MONTEREY 30'x60' QUADRANGLE AND ADJACENT AREAS, CALIFORNIA

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#### ABBREVIATED INDEX TO GEOLOGIC SOURCE DATA\*

- |                                                                                                                                                                                                                                                        |                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Santa Cruz Quadrangle<br>Clark, J.C., 1981; Stearny, R.G., and McCaffrey, Robert, 1983.                                                                                                                                                             | 13. Hollister Quadrangle<br>Dibble, T.W., Jr., and Rogers, T.H., 1975; Rogers, T.H., 1993; Rosenberg, L.L., 1998.                              | 26. Mount Ararat<br>Dibble, T.W., Jr., and Ross, D.C., 1973; Ross, D.C., 1972.                                                                                                                                                                                                                                                                         |
| 2. Soquel Quadrangle<br>Brady, E.E., 1989.                                                                                                                                                                                                             | 14. San Juan Bautista Quadrangle<br>Allen, J.C., 1946; Bishop, C.C., 1971; Dibble, T.W., Jr., 1979; Dupes, W.R., and Trisley, J.C., III, 1980. | 27. Gonzales Quadrangle<br>Dibble, T.W., Jr., and Ross, D.C., 1973; Trisley, J.C., III, 1975.                                                                                                                                                                                                                                                          |
| 3. Watsonville West Quadrangle<br>Brady, E.E., 1989; Dupes, W.R., and Trisley, J.C., III, 1980; Hal, N.T., Serna Wojcicki, A.M., and Dupes, W.R., 1974.                                                                                                | 15. Phonedale Quadrangle<br>Dupes, W.R., and Trisley, J.C., III, 1980.                                                                         | 28. Chualar Quadrangle<br>Dibble, T.W., Jr., and Ross, D.C., 1973; Trisley, J.C., III, 1975.                                                                                                                                                                                                                                                           |
| 4. Watsonville East Quadrangle<br>Brady, E.E., 1989; Bryant, W.A., Smith, D.P., and Hart, E.W., 1981; Dupes, W.R., and Trisley, J.C., III, 1980; Dibble, T.W., Jr., 1979; Hal, N.T., Serna Wojcicki, A.M., and Dupes, W.R., 1974; Grayson, R.W., 1997. | 16. Moss Landing Quadrangle<br>Clark, J.C., Dupes, W.R., and Trisley, J.C., III, 1980.                                                         | 29. Spreckels Quadrangle<br>Clark, J.C., Bralich, E.E., Dupes, W.R., and Rosenberg, L.L., 1995.                                                                                                                                                                                                                                                        |
| 5. Chittenden Quadrangle<br>Allen, J.C., 1946; Armstrong, C.F., 1980; Bishop, C.C., 1971; Bryant, W.A., Smith, D.P., and Hart, E.W., 1981; Dibble, T.W., Jr., 1979; Grayson, R.W., 1997; Rogers, T.H., 1993; Rosenberg, L.L., 1998.                    | 17. Marina Quadrangle<br>Dupes, W.R., and Trisley, J.C., III, 1980.                                                                            | 30. Seaside Quadrangle<br>Clark, J.C., Dupes, W.R., and Rosenberg, L.L., 1997.                                                                                                                                                                                                                                                                         |
| 6. San Felipe Quadrangle<br>Armstrong, C.F. and Wagner, D.L., 1978; Bryant, W.A., Smith, D.P., and Hart, E.W., 1981; Dibble, T.W., Jr., and Rogers, T.H., 1975; Grayson, R.W., 1997; Rogers, T.H., 1993; Rosenberg, L.L., 1998.                        | 18. Salinas Quadrangle<br>Dupes, W.R., and Trisley, J.C., III, 1980.                                                                           | 31. Monterey Quadrangle<br>Clark, J.C., Dupes, W.R., and Rosenberg, L.L., 1997.                                                                                                                                                                                                                                                                        |
| 7. Three Sisters Quadrangle<br>Bryant, W.A., 1985; Ouzh, L.H., 1970; Wagner, D.L., 1989.                                                                                                                                                               | 19. Natuash Quadrangle<br>Dupes, W.R., and Trisley, J.C., III, 1980; Bowen, O.E., 1973; Ross, D.C., 1972.                                      | 32. Orinoh area<br>Continental Slope and Monterey submarine canyon system:<br>Greene, H.G., 1970; Greene, H.G., 1999; McCullough, D.S., and Greene, H.G., 1990.<br>Continental Shelf (less than 150 meter water depth):<br>Elliott, S.L., Arma, B.J., and Stevenson, A.J., in press; Elliott, S.L., Arma, B.J., Stevenson, A.J., and Wang, J.L., 2001. |
| 8. Mariposa Peak Quadrangle<br>Dymally, J.L., Sog, D.H., and Russel, R.C., 1992.                                                                                                                                                                       | 20. Mount Harlan<br>Dibble, T.W., Jr., and Ross, D.C., 1973; Ross, D.C., 1972.                                                                 |                                                                                                                                                                                                                                                                                                                                                        |
| 9. Los Banos Valley Quadrangle<br>Dibble, T.W., Jr., 1975; Lettis, W.R., 1982.                                                                                                                                                                         | 21. Pajaro Quadrangle<br>Dibble, T.W., Jr., 1979.                                                                                              |                                                                                                                                                                                                                                                                                                                                                        |
| 10. Ruby Canyon Quadrangle<br>Dibble, T.W., Jr., 1979.                                                                                                                                                                                                 | 22. Cherry Peak Quadrangle<br>Dibble, T.W., Jr., 1979; Wilson, L.F., 1943.                                                                     |                                                                                                                                                                                                                                                                                                                                                        |
| 11. Queen Sabe Valley Quadrangle<br>Anderson, R.C., 1988; Dibble, T.W., Jr., 1975; Powell, D.C., 1974.                                                                                                                                                 | 23. Pancho Viejo Quadrangle<br>Dibble, T.W., Jr., 1979; Wilson, L.F., 1943.                                                                    |                                                                                                                                                                                                                                                                                                                                                        |
| 12. San Pedro Quadrangle<br>Dibble, T.W., Jr., 1979; Enos, Paul, 1965; Wilson, L.F., 1943.                                                                                                                                                             | 24. San Benito Quadrangle<br>Dibble, T.W., Jr., 1979; Enos, Paul, 1965; Wilson, L.F., 1943.                                                    |                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                        | 25. Bickmore Canyon Quadrangle<br>Dibble, T.W., Jr., 1979; Wilson, L.F., 1943.                                                                 |                                                                                                                                                                                                                                                                                                                                                        |

\*See enclosed text for complete references.