

**PS Lithostratigraphy of the Upper Miocene Monterey/Modelo Formation along Camino De La Cumbre, Sherman Oaks, California\***

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**Abstract**

The Middle to Upper Miocene Modelo or Monterey Formation outcrops along a roadcut on the northern flank of the Santa Monica Mountains in Sherman Oaks, CA. This 1,400 foot section of interbedded sandstone, diatomite and mudstone provides an opportunity to study the detailed stratigraphy of this interval and compare with sections previously identified by Hoots (1930), Rummelhart and Ingersoll (1997 and 1999), Redin (1984), and Wright (1991). According to these authors, the Monterey/Modelo Formation in this location was deposited during the subsidence of the Los Angeles Basin as part of a system of sandstone turbidites, fine-grained gravity flows, and hemipelagic sedimentation. While much is known about the sandstones within the Modelo Formation, very little is known about the relationship between the sandstones and associated fine-grained rocks. This independent research project aims to produce detailed characterization of a section of Middle to Upper Monterey/Modelo Formation using handheld spectral gamma ray readings at two-foot intervals in conjunction with lithologic description including key sedimentary features such as graded beds, speckled beds, varve-like laminations, scoured surfaces, bioturbation, etc. This project holds significance by aiding in correlation and interpretation of subsurface well logs as well as improving the understanding of facies relationships in mixed-clastic, diatomaceous sedimentary systems.

**References Cited**

Hoots, H.W., 1930, Geology of the eastern part of the Santa Monica Mountains, Los Angeles County, California: Shorter Contributions to General Geology, U.S.G.S. Professional Paper 165, p. 83-134.

Rummelhart, P., and R. Ingersoll, 1997, Provenance of the upper Miocene Modelo Formation and subsidence analysis of the Los Angeles basin, southern California: Implications for paleotectonic and paleogeographic reconstructions: Geological Society of America Bulletin, v. 109/7, p. 885-899.

Rummelhart, P. and R. Ingersoll, 1999, Three-stage evolution of the Los Angeles basin, southern California: Geology, v. 27/7, p. 593-596.

Redin, T., 1984, Oil and gas production from submarine fans of Los Angeles basin: AAPG Bulletin, v. 68/4, p. 520.

Wright, T. L., 1991, Structural geology and tectonic evolution of the Los Angeles basin, California overview: in Biddle, K. T., ed., Active margin basins: AAPG Memoir 52, p. 35–134.

# Lithostratigraphy of the Upper Miocene Monterey/Modelo Formation along Camino De La Cumbre, Sherman Oaks, CA

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## Abstract

The Middle to Upper Miocene Modelo or Monterey Formation outcrops along a roadcut on the northern flank of the Santa Monica Mountains in Sherman Oaks, CA. This 1400' section of interbedded sandstone, diatomite and mudstone provides an opportunity to study the detailed stratigraphy of this interval and compare with sections previously identified by Hoots (1930), Rummelhart and Ingersoll (1997 and 1999), Redin (1984), and Wright (1991). According to these authors, the Monterey/Modelo Formation in this location was deposited during the subsidence of the Los Angeles Basin as part of a system of sandstone turbidites, fine-grained gravity flows, and hemipelagic sediment. While much is known about the sandstones within the Modelo

Formation, very little is known about the relationship between the sandstones and associated fine-grained rocks. This independent research project aims to produce detailed characterization of a section of Middle to Upper Monterey/Modelo Formation through the use of handheld spectral gamma ray readings at two foot intervals in conjunction with lithologic description including key sedimentary features such as graded beds, speckled beds, varve-like laminations, scoured surfaces, bioturbation, etc. This project holds significance by aiding in correlation and interpretation of subsurface well logs as well as improving the understanding of facies relationships in mixed clastic-diatomaceous sedimentary systems.

## Methods

- Handheld spectral gamma ray with readings taken every two feet
- Jabobs staff to measure total stratigraphic thickness
- XRD for confirmation of lithologies
- Visual description of outcrop
- Microsoft Excel for data analysis and graphing

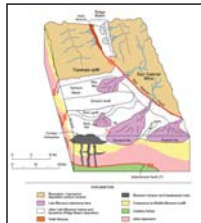
## Future Work

- Continue with data collection and fill in gaps
  - Quantify detailed facies relationships (i.e. percent of muddy diatomite to pure diatomite)
- Possible master's thesis work could include:
- Repeating the same study on other sections in the area to understand lateral facies changes
  - Paleocurrent/Paleoenvironment reconstruction
  - Detailed XRD and geochemistry for stratigraphic trends

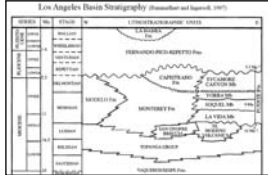
## Depositional Environment and Location



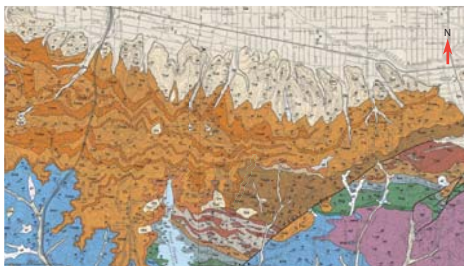
(Left) Google Maps image showing the location of the field area (red star). The section of Monterey/Modelo Formation outcrops along Camino De La Cumbre in Sherman Oaks. The street can be accessed via Hwy. 101 and Ventura Blvd.



Block diagram showing the paleogeography of the Los Angeles and Ventura Basins during deposition of the Monterey/Modelo Formation. (Rummelhart and Ingersoll, 1997)



Generalized stratigraphy of the Los Angeles Basin trending W-E. (Rummelhart and Ingersoll, 1997)



Geologic map of the eastern Santa Monica Mountains (Dibblee and Ehrenspeck, 1991). The green line represents the street in which the outcrop is exposed.



Satellite image from Google Earth showing the topography and extent of the outcrop. Camino De La Cumbre is outlined in green (Google Earth, 2013).



-Interbedded white, laminated diatomite with muddy, diatomaceous, "speckled beds".



-Interbedded white, laminated diatomite with muddy, diatomaceous, "speckled beds" (close-up). (Photo credit: Dr. Richard Behl)

-Massive, fine- to coarse-grained, poor- to well-sorted, thick-bedded sandstone with a predominantly quartzofeldspathic composition. The matrix varies in clay content and is grain-supported.



-Cross-bedding with scour surface. Sedimentary features like this occur frequently throughout the stratigraphic section.



-Example of relatively pure diatomite breaking off into large blocks.

## References and Acknowledgements

Dibblee, T.W., and Ehrenspeck, H.E., ed.: Dibblee Geological Foundation Dibblee Foundation Map DF-31, scale 1:24,000.

"North-eastern Santa Monica Mountains." 34°08'21.27"N and 118°26'20.68"W. Google Earth. December 10, 2013. September 15, 2014.

Rummelhart, Peter, and Ingersoll, Raymond. 1997. Provenance of the upper Miocene Modelo Formation and subsidence analysis of the Los Angeles basin, southern California: Implications for paleotectonic and paleogeographic reconstructions: Geological Society of America Bulletin, v. 109, no. 7, p. 885-899.

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