

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



NCGS FIELD TRIP
Saturday June 2, 2012

OCEAN FLOOR TO THE SHELF -
THE LOWER TERTIARY SEQUENCES ON THE FLANKS OF MT. DIABLO
Raymond Sullivan, Professor Emeritus, San Francisco State University

The main objective of the field trip is to view the lower Tertiary depositional sequences defined in the Sacramento basin in the outcrops on the flanks of Mt Diablo. The lower Tertiary succession is composed of a cyclic succession of bathyal shales and sandstones and shallow marine sandstones. The succession attains a maximum thickness of about 2440 meters (8,000 feet) in the depocentral graben in the southwestern part of the basin. The Eocene succession is composed of at least five unconformably bounded depositional sequences. These include the Meganos and Markley submarine canyons filled with bathyal shales; the thick succession of submarine fan deposits that make up the Markley Sandstone; and fluvial/estuarine sandstones and neritic shales that comprise the Hamilton/Capay and Domengine/ Nortonville sequences. These sequences can be correlated with equivalent units that outcrop along the flanks of the Mount Diablo uplift.

The first stop on the field trip will at Castle Rock to view the submarine fan deposits of high-density turbidites that are equivalent in age to the Domengine Formation. The second stop will be at Lime Ridge where shallow water Domengine Formation is exposed on the east side of the Concord fault. The third stop will be at Keller Canyon Landfill where a thin stratigraphic section of Sidney Flat Shale (about 100 feet or so thick) is unconformably overlain by the Upper Tertiary. The Sidney Flat Shale thickens eastward to over 1000 feet at our fourth stop in the Black Diamond Mines. Underlying the Sidney Flat Shale in the Preserve is 2,500 feet of Markley Sandstone.

After lunch, we will drive to the south end of the Black Diamond Mines Preserve to view the Eocene sequences. We will be able to view the fluvial/estuarine deposits of the Domegine Formation and the underlying succession that includes the Meganos submarine canyon fill deposits. Time permitting, a brief stop will be made along Lone Tree Way where the Meganos submarine canyon produces a wide topographic depression as it is traced southward to the Brentwood Oil Field. The final stop of the trip will be at the sand pits in the Domengine Formation at Byron. If permission is granted, we will view the glass sand operation of a subsidiary of Gallo Wines. These are the last outcrops of the Coast Ranges as the succession descends into the Sacramento Valley. The middle Eocene succession at this location differs from the equivalent units at Black Diamond Preserve in several important ways. First, the Meganos submarine canyon mud fill is only thinly represented and we must be outside of the canyon. Second, the Domengine Formation has thickened from 800 feet to over 1000 feet and a brown sandstone member in the upper part of the formation is missing in the section. Lastly the 2500 feet of Markley Sandstone is absent in the 10 miles or so that we observed the formation in the Preserve, and Sidney Flat Shale equivalent rests directly on Nortonville Shale.

We will conclude the field trip with a discussion on the stratigraphic relationships between the Eocene sequences, together with a broad over view of the Eocene history of the Sacramento basin. In addition, we will discuss the role of tectonism and eustasy in the timing and distribution of the lower Tertiary deposition sequences.

The field trip will cover a lot of territory and we need to minimize the number of vehicles. The Keller Canyon Landfill and the Byron Mines management as well as the Black Diamond Mines Preserve administration are very concerned about the number of vehicles that we plan to use on the field trip. As a result, we are limited to 30 participants and a maximum of 2 vans and 2 SUVs. The traffic in the Highway 4 corridor is very congested and we need to drive with a great deal of care.

THIS FIELD TRIP WILL BE LIMITED TO 30 PEOPLE.

***** **Field Trip Logistics** *****

Time & Departure: June 2, 2012, 8:00 am, Southwest corner parking lot Sun Valley Mall, Concord
Cost: \$40/person (includes transportation, guidebook, lunch, refreshments, soft drinks)

***** **REGISTRATION FORM (Field Trip)** *****

Name: _____ E-mail: _____
Address: _____ Phone (day): _____ Phone (evening): _____
Lunch: Regular: _____ Vegetarian: _____ (Please check one) Check Amount: _____

Please mail a check made out to "NCGS" to: **Tridib Guha, 5016 Gloucester Lane, Martinez, CA 94553**

Questions: e-mail: tridibguha@yahoo.com Phone: (925) 370-0685 (evening) (925) 451-1999 (day)