

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



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## THE SECOND NCGS FIELD TRIP TO THE WILSON

GROVE & PETALUMA FORMATIONS, SONOMA COUNTY, CA

**Saturday June 28, 2008**

**Leaders: James Allen, MS, PG, Dept. of Earth and Environmental Science, CSU East Bay**  
**Peter Holland, CEG, Vector Engineering**

The Petaluma Formation, located in Sonoma County, California, is a Late Miocene to Late Pliocene nonmarine formation with important, recently identified marine interbeds. The formation is located in Sonoma County, California. The formation was originally divided into two members. After further study, we have divided the formation into three informal members based on lithology. The "lower" member is predominantly shale with both nonmarine and newly discovered marine microfauna. This member is prone to sliding. The "middle" member is predominantly conglomerate derived from Franciscan sources, the upper member is conglomerate derived, in part, from the Monterey Group of the East Bay area. Understanding of the three members allows for stratigraphic correlation in areas of poor exposure, such as in core data from the Santa Rosa valley. Other fluvial, conglomeratic formations in the North Bay are the volcanoclastic Huichica and Glen Ellen formations, both younger than the Petaluma. The Petaluma intertongues with the coeval Wilson Grove Formation to the west and both, as a continuous through-going fluvial- to marine system, have been offset from units with identical age, lithologies and source rocks east of the Hayward fault.

The Petaluma Formation has been the focus of geologists' attention for over a century. In the early part of last century, oil was discovered in structural traps east of Adobe Road and there are still active oil seeps in that area, for example at Lynch Creek. Some ranchers near the oil field area have reported hydrocarbon abundance in their groundwater wells, forcing them to abandon the water wells. There are also a number of natural gas wells in the Cotati Gas Field within the paleo-shoreline area where the Wilson Grove is interbedded with the Petaluma. There have been numerous nonmarine and marine microfossil, invertebrate and vertebrate fossils recovered from both the Wilson Grove and Petaluma formations as well. Marine microfauna in the "lower" shale of the Petaluma potentially may shed light on sources of oil. Diatomite analysis reveals new information about the "upper" member of the Petaluma.

The interbedded nature between the Petaluma and Wilson Grove formations has been difficult to understand by previous researchers. This is due in large part to poor exposures. Also, the Wilson Grove formation is largely flat lying with relatively minor deformation affecting it, while the Petaluma Formation has been highly folded and faulted and is overlain in many places by equally deformed Sonoma Volcanics and underlain by Donnell Ranch Volcanics. The geographical location the Petaluma Formation roughly coincides with the major strike-slip fault system in the North Bay, which has led others to erroneously believe that the Petaluma is an older, more deformed formation relative to the Wilson Grove. New paleontological and radiometric data helps to further constrain stratigraphic relationships between both formations.

Some items we will address on the field trip will be the "type" lithology and stratigraphy of the Petaluma Formation in the Cotati area. From there, we will determine stratigraphic position of spotty outcrops exposed between Cotati, Sonoma Mountain and Sonoma Valley based on the "type" section in Cotati. Items to discuss will be strike-slip displacement, source rocks and location of active faulting.

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

**THIS FIELD TRIP WILL BE LIMITED TO 30 PEOPLE. Time & Departure: 8:30 A.M. Sharp! Cost: \$25/person**

We will meet at the **Southbound** Park and Ride lot at Highway 101 and Rohnert Park Expressway, in Rohnert Park. Take the Rohnert Park Expressway exit. There are northbound and southbound lots; go to the smaller lot on the **west** side of Highway 101. We will try to consolidate into as few cars as possible and **leave at 8:30 sharp**. Bring boots; the first exposure is about a 1/4 mile hike across a grassy hillside. We should finish by 4:00 PM. **Call me on my cell phone at 707-548-3268 if you have any problems.**

\*\*\*\*\***Registration Form (Wilson Grove & Petaluma Formation 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: Rob Nelson, 269 College View Drive, Rohnert Park, CA 94928; Carpooling is suggested for this fieldtrip. Parking onsite is very limited. Please let us know if you can provide a van and NCGS can reimburse your gasoline expenses.**

Questions: e-mail: [rlngeology@sbcglobal.net](mailto:rlngeology@sbcglobal.net) Phone: (707) 795-8090 (evening) (707) 548-3268 (day)