

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



“An undefined Petroleum system along the Santa Cruz County, California.”



NCGS FIELD TRIP - Saturday April 25, 2015

Field Trip Leaders:

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Field Trip Director:

Tridib Guha

“An undefined Petroleum system along the Santa Cruz County, California.”

Numerous asphalt-saturated sandstone deposits on and near the Santa Cruz County coast in central California confirm the presence of a previously undefined petroleum system. These asphalt occurrences lie about 25 to 50 km south-southeast of the La Honda Basin, where 5 small oil fields have produced nearly 2 million barrels of oil and 300 million cubic feet of gas. The close proximity of the Santa Cruz County coast to the petroleum system of the La Honda Basin indicates that similar elements are at work along the coast. The likely source rock for these asphalt deposits is California's "superstar" oil source rock, the Monterey Formation. It has been suggested that the Santa Cruz Mudstone overlying the Monterey Formation could also serve as a local petroleum source rock. However, the real importance of the Santa Cruz Mudstone is that it is the thickest of three overburden rocks that are required to thermally mature the underlying Monterey Formation. All this happens on the southern flank of the Ben Lomond Mountain, a persistent granitic and metamorphic high. The offset of the San Gregorio Fault plays a crucial role in determining the critical moment for this petroleum system.

To better understand the petroleum system in this area, we will investigate the migration pathways and reservoir rocks along the Santa Cruz county coast. At our first four stops, we will be standing on young marine terrace deposits but looking primarily at Santa Cruz Mudstone, and to a lesser extent, Santa Margarita Sandstone. There are no exposures of the Monterey Formation along the coast in our field trip area.

A major geologic feature of the Santa Cruz County Coast is the sand injectite. On this field trip we will see a large subaerially exposed injectite complex at Yellow Bank and Panther beaches. Here, fluidized sand from the Santa Margarita Sandstone is injected upward into fractured Santa Cruz Mudstone. The emplacement of these intrusions was facilitated because deposition and induration of the Santa Cruz Mudstone increase confining pressure within underlying siliciclastic unit; stresses triggered the injection of sand into the lower pressured fractures in the mudstone.

We will also observe carbonate concretions on the beach in the city of Santa Cruz that mark the locations of fossil seafloor cold seeps. These vent structures closely resemble modern-day examples found on the floor of Monterey Bay. Both modern and fossil vent features appear to be closely associated with fault systems. The occurrence of carbonate slabs in areas of active hydrocarbon seepage is common in seafloor settings.

Please carpool/vanpool and share the ride and cost. We will circulate an attendees list for carpooling to the meeting place. No. geologic hammers are allowed!

THIS FIELD TRIP WILL BE LIMITED TO 30 PEOPLE.

***** **Field Trip Logistics in preparation** *****

Time & Meeting Place: April 25, 2015, 9:00 am at the meeting place (will be notified)

Cost: \$40/person, which includes a guidebook, morning coffee, muffins, lunch, and refreshments. No more plastic water bottles will be allowed on Field Trips! Please bring your own water bottle.

*******REGISTRATION FORM (Santa Cruz Field Trip)*******

Name: _____

E-mail: _____

Carpool origin Residence: _____

Phone: _____ Phone (alternate): _____

Check no./amount _____

Please indicate if you want drive a car and the # of people on ride share

Lunch: Regular: _____ Vegetarian: _____

(Please check one) _____

Please mail registration with a check payable to NCGS:

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