

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## NCGS FIELD TRIP

### *Mammoth Rocks and the Geology of the Sonoma Coast*

**Sunday April 25, 2010**

#### **Field Trip Leaders:**

**Edward Breck Parkman**, *Senior State Archaeologist California State Parks*  
**Rolfe Erickson**, *Professor Emeritus, Sonoma State University, Dept. of Geology*

The Mammoth Rocks site, also known as Sunset Rocks, is located within Sonoma Coast State Park, a unit of the California Department of Parks and Recreation. The site, which is located approximately 80 km north of San Francisco, and 2 km south of the mouth of the Russian River, near Goat Rock, occupies a coastal terrace overlooking the Pacific Ocean. The site consists of four loci of rocks that are characterized by highly polished surfaces and separated by about 300 m. Locus 1, the most northern and primary of the loci, consists of numerous boulders associated with a fractured 20 m tall metamorphic blueschist sea stack. Locus 2 is a 30 m tall blueschist seastack. The other two loci are smaller blueschist boulders (4 and 5 m tall). The four loci surround an enigmatic wetland that might conceivably represent a relic animal wallow.

In 2001, a unique polish was discovered on many of the rock surfaces at the Mammoth Rocks site. The polish is found on exposed vertical exposures to a height of 4 m. The distribution of the polish suggests a polishing agent that was selective, rather than arbitrary and/or uniform. The character of the polish resembles what is found on historic bison rubbing rocks on the American Plains and on elephant rubbing rocks in East Africa. It has been proposed, but not yet proven, that the polish found at the Mammoth Rocks site was derived from the grooming behavior of now-extinct Rancholabrean megafauna, especially the Columbian mammoth and ancient bison.

During our visit to the Mammoth Rocks site, the tour leaders will describe the "discovery" of these unusual polished rocks, the scientific methods that have been employed in their study, and what remains to be done to conclusively determine the origin of the polish.

After lunch, Rolfe Erickson will lead us from Wright's Beach campground north along the ocean cliffs a kilometer or so, studying an exceptional group of Franciscan rocks as we go. We will observe a massive, featureless sandstone-matrix olistostrome melange changing into a tectonic melange of sheared sandstone phacoids in a sheared shale matrix. This happens due to the addition of relatively weak shale layers into the stratigraphy and the action of shearing forces along the plate boundary. We will also study several interesting exotic blocks from the melanges, some of which have unusual shapes suggesting an unusual history for Franciscan units. This hike will provide a good introduction / review to the main Franciscan rock types and structures.

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

**THIS FIELD TRIP WILL BE LIMITED TO 50 PEOPLE. Cost: \$25.00**

Please carpool as parking is limited. East Bay people may want to carpool at the BART El Cerrito Del Norte lot. We will meet at 9:30AM at the small parking lots along Goat Rock Rd. within 0.3 mile west of Highway 1 south of Jenner and the Russian River. To help coordinate carpooling, a list of attendees and maps will be forwarded before the trip. Field trip includes coffee and donuts, a lunch and a guidebook.

\*\*\*\*\***Registration**\*\*\*\*\*

#### **Registration Form for Mammoth Rocks and the Geology of the Sonoma Coast 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: **John Christian**, 931 Liberty St., El Cerrito, CA 94530

**Carpooling is strongly suggested for this fieldtrip.** Questions: e-mail: [jmc62@sbcglobal.net](mailto:jmc62@sbcglobal.net) Phone: (510) 558-1585 (evening)