

*2014 Annual Pacific Cell Friends of the Pleistocene Field Trip
to the Tecopa Basin, Southeastern California*

Friday through Sunday, November 7-9



Trip Leaders:

**John Caskey, Marith Reheis, Gary Scott, Dan Larsen,
Matt McMackin, Chris Menges, and Jeff Knott**

photo by Marli Miller (marlimillerphoto.com)

2nd Announcement

2014 Annual Pacific Cell Friends of the Pleistocene Field Trip

**Pleistocene Geology of the Tecopa Basin,
Southeastern California**

(Friday through Sunday, November 7-9)

Visit the FOP website — <http://www.fop.cascadiageo.org>

In this announcement:

- trip overview
- camping information, directions, logistics
- field trip registration form and payment method
- ride-sharing information and links

Trip Overview:

The Tecopa basin and its well-exposed basin-fill sediments have been studied for decades and are a favorite focus of western geology field trips. Sheppard and Gude (1968) first examined the chemical alteration of the sediments and recognized three main tephra layers—named Tuffs A, B, and C—which formed the basis for correlation of stratigraphy throughout the basin. Jack Hillhouse (1987), with the help of Andrei Sarna-Wojcicki et al. (1987; also Izett et al., 1970) correlated these tuffs to the Lava Creek, Bishop, and Huckleberry Ridge tephra, respectively, using glass chemistry and paleomagnetic data. Roger Morrison (1991, 1999) made the first attempt to construct a comprehensive lake-level history for the Tecopa basin, and proposed that the last major highstand reached ~543 m early in OIS 6. Finally, Dan Larsen (2008) recently refined the lacustrine history using detailed sedimentology and patterns in the style and degree of diagenetic alteration.

For the last few years, some of us have been looking at other evidence for lake history by analyzing sediments for ostracodes as an indicator of depositional and chemical environment and by looking for preserved shoreline deposits and (or) strandlines around the basin as indicators of true lake levels. Additional work is also being done on dating the tuffs, paleomagnetic chronostratigraphy, and soft-sediment (including seismogenic) deformation expressed within tephra layers throughout the basin (Gibert et al., 2011). Topics that will be discussed and debated during the trip include:

- new tephra ages and revisions of cross-basin correlations and deposition rates in the pre-Bishop sedimentary sequence,
- depositional environments (lacustrine vs. ground-water discharge vs. playa) and diagenetic alteration of basin sediments,
- revisions to the lake-level history of the basin,
- north-side-up deformation of the basin reflected in middle Pleistocene shoreline deposits,
- the nature of the lake threshold and possible lake-level lowering and stabilization during the terminal lake stand,
- timing of Amargosa River integration with the Tecopa and Death Valley watersheds,
- new observations tying the OIS 6 shoreline-level history of pluvial Lake Manly to the well-dated and studied Badwater core, and
- seismogenically-induced liquefaction-induced deformation observed throughout the basin.

We do not intend to put together a large collection of guidebook articles with the field trip road log, but rather short summaries of some of the new observations, a few diagrams, and links to previously published papers as background. Look for the downloadable guidebook in early October (or later, but before the trip).

See you in Tecopa!

John Caskey, Marith Reheis, Gary Scott, Dan Larsen, Chris Menges, Matt McMackin, Jeff Knott, and others

Short Bibliography (Links to the papers are provided if available)

Gibert, L., Alfaro, P., García-Tortosa, F.J., and Scott, G.R., 2011. Superposed deformed beds produced by single earthquakes (Tecopa Basin, California): Insights into paleoseismology. *Sedimentary Geology* 235, 148–159.

http://ac.els-cdn.com/S0037073810002289/1-s2.0-S0037073810002289-main.pdf?_tid=f2954422-355f-11e4-8f91-0000aab0f6b&acdnat=1409964875_f43d61f399852a93c4c9da588eef7edb

Hillhouse, J.W., 1987. Late Tertiary and Quaternary geology of the Tecopa basin, southeastern California. U.S. Geological Survey.

<http://pubs.usgs.gov/imap/1728/report.pdf>

Izett, G.A., Wilcox, R.E., Powers, H.A., and Desborough, G.A., 1970. The Bishop ash bed, a Pleistocene marker bed in the western United States. *Quaternary Research* 1, 121-132.

<http://pubs.usgs.gov/bul/1675/report.pdf>

Larsen, D., 2008. Revisiting silicate authigenesis in the Pliocene-Pleistocene Lake Tecopa beds, southeastern California: Depositional and hydrological controls. *Geosphere* 4, 612-639.

Morrison, R.B., 1991. Quaternary stratigraphic, hydrologic, and climatic history of the Great Basin, with emphasis on Lakes Lahontan, Bonneville, and Tecopa, In: Morrison, R.B. (Ed.), *Quaternary Nonglacial Geology: Conterminous U.S.* Geological Society of America, Boulder, Colorado, DNAG v. K-2, 283-320.

Morrison, R.B., 1999. Lake Tecopa: Quaternary geology of Tecopa Valley, California, a multimillion-year record and its relevance to the proposed nuclear-waste repository at Yucca Mountain, Nevada, In: Wright, L.A., Troxel, B.W. (Eds.), *Cenozoic Basins of the Death Valley Region*. Geological Society of America Special Paper 333, 301-344.

Sarna-Wojcicki, A.M., Morrison, S.D., Meyer, C.E., and Hillhouse, J.W., 1987. Correlation of upper Cenozoic tephra layers between sediments of the western United States and eastern Pacific Ocean, and comparison with biostratigraphic and magetostratigraphic age data. *Geological Society of America Bulletin* 98, 207-223.

Sheppard, R.A., and Gude, A.J., III, 1968. Distribution and genesis of authigenic silicate minerals in tuffs of Pleistocene Lake Tecopa, Inyo County, California: U. S. Geological Survey Professional Paper 597, 38 p.

<http://pubs.usgs.gov/pp/0597/report.pdf>

Camping Information & Directions

Getting to FOP!

From the South: From I-15 at the freeway “town” of Baker, CA:

- head north on CA-127 N; go 51 miles to intersection on the left with Furnace Creek Wash Rd. It's only a stones throw past the well-marked, hard-right turn toward Tecopa Hot Springs.
- turn left (west) onto Furnace Creek Wash Rd; go 4.8 miles to turnoff into FOP camping area.
- make hard right turn onto dirt road. Our camping area is in the general area down-fan from the turnoff. The well-paved and varnished fan surfaces should make for nice camping areas. Please do all possible to minimize disturbance to the fan surfaces around our camp.

From the North: From US-95 at Beatty, NV:

- continue south on US-95 for 30 miles to turn-off south onto NV-373.
- turn right (south) onto NV-373; go 16.3 miles to the CA state line where the highway name changes to CA-127. Continue south on CA-127 for 33 miles to the intersection with CA-178; from here you have two options to get to camp, which is located on the south side of the Dublin Hills. The second is only about one mile longer and quite a bit less dustier.

Option 1 (the dustier, slightly shorter option)

- turn right (west) onto CA-178; go 6.8 miles to Furnace Ck Wash Rd.
- turn left (south) onto Furnace Creek Wash Rd; go 3.9 miles. The left (east) turn into our camp area is just around the low ridge of volcanic rocks on the left.

Option 2 (the less dusty, slightly longer option)

- from the intersection of CA-127 and CA-178 continue south on CA-127 for 6.8 miles to intersection on the right onto Furnace Ck Wash Rd. The turn comes up just before you reach the well-marked left fork toward Tecopa Hot Springs.
- turn right (west) onto Furnace Creek Wash Rd; go 4.8 miles to right (east) turnoff into FOP camping area. FOP camping will be on the well-paved and varnish fan surfaces along side the “established” jeep trails in this area.

We will be in the same FOP camping area for all three nights (Th., Fri., Sat.), so we will not have to pick up camp until Sunday morning when we leave for Day 3 stops. The lat-long coordinates for the turnoff to camp from Furnace Creek Wash Rd. are 35.9013 N, 116.259588° W.

A Google Earth kmz file showing (and providing coordinates for) the locations of camp, all the FOP stops for the three day trip, and the main road turn off points will be provided on the FOP web site <http://www.fop.cascadiageo.org> when the guidebook is posted in October.

Some Basic FOP Logistix and Registration Information

There is no limit to the number of participants for this year's FOP—come one, come all! If you have dogs, they are welcome on the trip, but please keep in mind that there is no water and little shade around camp and most of the areas that we'll be visiting on the trip.

As with all FOPs, car pooling with the maximum feasible number of people per vehicle is strongly encouraged during the trip. All stops on this trip can be accessed without high clearance vehicles. Camp is very close to the town of Shoshone (~10 mi) which has limited amenities, but great for getting ice and beer etc. Ice is also available at the small community store next to the Tecopa Hot Springs Resort Office. Pahrump, Nevada is a much larger town and is only 26 mi east of Shoshone.

Please prepare for highly variable weather conditions; we have ordered calm, beautiful weather for the trip. However there is the potential for very high winds anywhere, and at anytime in the Mojave desert. Our camping area is very exposed to the elements. So if you are tent camping, bring strong, deeply penetrating tent stakes (just in case our order for the best possible weather doesn't get filled).

If you have firewood that you can contribute to the community fire pit, FOP will welcome any and all firewood donations. Please note that we would like to limit the number of open fires to one, and that is the community fire pit. So please **do not have personal fires** at your individual camp sites. Please cook with camp stoves or cook in the community fire pit if necessary.

Finally, the trip leaders also request that you **please do not light any type of fireworks at any time on the FOP**. It may be fun to do, but it is not cool to do on the FOP for a number of obvious reasons.

RIDE SHARING

If you are looking for a ride to FOP or if you have room and are willing to take riders to the FOP, including giving a lift to those flying in to McCarron International Airport (Las Vegas) please use the RIDE SHARE website
http://www.fop.cascadiageo.org/?page_id=127

FOP 2014 Registration

Registration fees for this year's FOP are \$25 per person. The funds go toward portable toilets, t-shirts, two kegs of beer, one for the welcome party and one for the night of the business meeting. Guidebooks will be available online for free at the website link, hopefully by no later than two weeks before the trip.

Please register in advance if you can. It helps us with planning for the trip.

You can register by emailing the FOP 2014 Registration Form to John Caskey at (caskey@sfsu.edu) and paying registration fees using the PayPal method (see following link).

http://www.fop.cascadiageo.org/?page_id=124 Alternatively, registration fees can be paid by check and sent with the attached registration form by regular mail (see address below). Please make checks payable to John Caskey. You also can opt to register on-site upon arrival.

On your registration forms please list the names, email addresses, and requested T-shirt size for each individual listed on the form.

John Caskey
Department of Earth & Climate Sciences
San Francisco State University
1600 Holloway Ave.
San Francisco, CA 94132