



Association of Environmental & Engineering Geologists San Francisco Section

ANNOUNCING THE AEG SAN FRANCISCO SECTION
APRIL 2012 MEETING

STUDENT PRESENTATION NIGHT! Featuring:

Dylan Duvergé, San Francisco State University
Kelly Nicole Dustin, San Jose State University
Mike George, University of California at Berkeley

This Month's Meeting is Sponsored by:



MEETING DETAILS

Restaurant

Sinbad's

Pier 2 Embarcadero Street

San Francisco, CA

[Map](#)

Date and Time

Tuesday, April 10th, 2012

6:00 pm—Social Hour and Sign-in

7:00 pm—Dinner

8:00 pm—Presentation

Cost: \$45 Members & Members' spouses; \$50 Non-Members, \$20 for Students

Menu

- 🍷 Salmon Florentine
- 🍷 Snapper
- 🍷 London Broil

- 🍷 Chicken Picatta
- 🍷 Shrimp Louis
- 🍷 Vegetarian Pasta

Reservations*: To RSVP, please fill out the online form at <http://goo.gl/dJY83> **Last Chance!** by **12 PM, Monday, April 9th**

Driving Directions: From the Bay Bridge, take the Fremont Street Exit and the Folsom Street Ramp. Go left (east) on Folsom Street, then left (north) onto the Embarcadero (Herb Caen Way). The driveway for Sinbad's is on the right, south of the historic Ferry Building. Please watch out for the pedestrians and cyclists when turning into the driveway. Thank you.

BART Directions: Exit the Embarcadero Station; walk up Market Street toward the Ferry Building (less than ½ a mile toward the Bay and to the east). Cross Embarcadero and Sinbad's is located next to the Alameda ferry pier on the south side the historic Ferry Building.

Parking: \$5 valet parking is available or there are meters located on nearby side streets.

*Please RSVP in advance. Walk-ins are welcome, but not guaranteed. No shows will be charged.

See next page for abstracts and speaker biographies.

Featured Student Speakers

Dylan Duvergé, San Francisco State University

Background Arsenic Concentration in Soil of the Urbanized San Francisco Bay Region

Abstract: Soil analysis data within the nine-county San Francisco Bay Area was compiled from the State Water Quality Control Board's Geotracker online database to determine the background levels and variability of arsenic concentrations across four Quaternary geologic units. Arsenic analyses of 1,454 soil samples across 77 sites were screened from Geotracker for inclusion in a JMP 7.0 database. Mean arsenic concentrations within Holocene alluvium (5.10 mg/kg) were determined to be statistically greater than those within Pleistocene alluvium (3.65 mg/kg) and "other" Quaternary units (3.30 mg/kg); and no significant relationship was found between arsenic concentrations and sampling depth. The proposed upper estimate for background arsenic (99th percentile) within undifferentiated flatland soils of the study area—11.00 mg/kg—is markedly lower than commonly cited sources in the literature. These findings present the first regional estimates of background arsenic concentrations in the San Francisco Bay Area.

Bio: Dylan Duvergé is a recent graduate of the from San Francisco State University's Geosciences Department, who completed a master's thesis examining regional background levels of arsenic in soil of the San Francisco Bay Area. Dylan performed this study at the request of Regional Water Board staff, and in recognition of the need to develop better background data on trace metals. He is currently employed as an environmental analyst at ESA PWA in San Francisco, where he conducts environmental reviews of renewable energy projects, mining operations, and water/wastewater infrastructure projects.

Kelly Nicole Dustin, San Jose State University

Intrusive Relationships and Deformation of Mafic and Tonalitic Rocks in Part of the Seven Fingered Jack Pluton, North Cascades, Washington

Abstract: The crystalline core of the North Cascades preserves a crustal section through a Cretaceous continental magmatic arc and provides an excellent opportunity for study of magmatic systems at different crustal depths. The 6-8 kb, ~91 Ma Seven Fingered Jack pluton (SFJ) is a markedly elongate body (~30 by 5 km), which has been previously mapped as a highly heterogeneous sheeted pluton in the NW, but as largely tonalite along strike to the SE. Detailed mapping of a ~2 km² area in the Klone Peak area shows that the eastern margin of the southern portion of the pluton is also very heterogeneous and sheeted, and intrudes the Triassic Dumbell orthogneiss. In the study area, the SFJ pluton is composed of four units: (1) a 50-100-m-thick mafic complex, which contains xenoliths, irregularly shaped patches, and enclaves of hornblende ranging from 2-30 cm in length, enclosed in gabbro and diorite, all of which are cut by felsic dikes; (2) a heterogeneous diorite, mapped in three 75-100-m thick sheets, with less abundant gabbro and hornblende enclaves and dikes (3 cm-3 m wide); (3) a 100-300-m-thick diorite; and (4) a much larger internal mass of hornblende-biotite tonalite. Each unit contains internal heterogeneities, which are less common in more felsic magmas. Mingling occurs between rocks of the heterogeneous diorite and the mafic complex. Contacts of all units trend NW and are gradational. Foliations, both magmatic and solid-state, strike NNW, concordant to sheet/unit contacts, and normal to the inferred regional shortening direction. Dips range from steep to nearly vertical, and are to the SW and NE. Foliation ranges in intensity from moderate to strong in all units. Lineations in the area mainly plunge gently to moderately to the NW or SE. In summary, the eastern margin of part of the SFJ pluton is a heterogeneous, sheeted, mid-crustal pluton constructed by multiple pulses of intermediate to mafic magma that dynamically interacted.

Bio: Kelly Nicole Dustin was born and raised in San Jose and graduated with honors from San Jose State University with a BS in Geology in 2011. She is currently pursuing her MS in Geology at San Jose State with Dr. Robert Miller and is the current 2011-2012 President of the SJSU Geology Club.

Awards:

2010 Field Camp Award - SJSU

2010 AWG (Association for Women Geoscientists) Outstanding Student Award

2010-2011 S³ Scholarship, Scholars in Science through SJSU

Published:

GSA abstract with the Cordilleran Section 2012

Personal:

She loves to read

When out of the field, she enjoys yoga, kickboxing, and taking her dogs to the beach!

Mike George, University of California at Berkeley

Scour Assessment of Blocky Rock

Abstract: Scour of rock is a complex process and can be very problematic for dams when excessive scour threatens dam stability. Removal of individual rock blocks is one of the principle mechanisms by which scour can occur, particularly in unlined spillways and on dam abutments. To alleviate some of the complexity, commonly used methods for scour prediction tend to simplify the rock mass using rectangular block geometries or incorporate empirical relationships for the rock mass and do not actually model the physical scour process. Such simplifications can be problematic, particularly for block analysis, where the 3D orientation of discontinuities within the rock mass largely influence block removability. To better represent the 3D structure of the rock mass, block theory has been applied to evaluate stability of removable rock blocks subject to hydraulic forces. Block theory provides a rigorous methodology to identify removable blocks, determine potential failure modes, and assess block stability.

Bio: Mr. George has a BS in Geological Engineering from the Colorado School of Mines. He is currently completing his MS in Geotechnical Engineering at UC Berkeley and plans to continue his studies toward Ph.D. Prior to graduate school, Mr. George spent six years working as a consulting engineer performing various scour projects in the USA and abroad including many dam overtopping and spillway rock scour assessments. Mr. George is currently registered as a Professional Engineer in the State of Colorado.

Special Thanks to This Month's Sponsor:



Thank you for the RSVP! See you on **Tuesday, April 10th, 2012**