San Joaquin Geological Society

Date: **Tuesday, March 12, 2019**

Time: 6:00 PM Social Hour
7:00 PM Dinner
8:00 PM Lecture

Place: American Legion Hall
2020 H Street, Bakersfield, CA 93302

PSAAPG Members
$25 with reservation
$30 without reservation

Non PSAAPG Members
$30 with reservation

Full-time Students with ID:
$10

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http://www.SanJoaquinGeologicalSociety.org/

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California Resources Corp.
Jonathan.Goodell@crc.com

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Berry Petroleum
kwhitaker@bry.com

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Lindsey.Thompson@sageriderwest.com

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jprosser@envirotechteam.com

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DOGGR
Jeff.Kimber@conservation.ca.gov

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DOGGR
Cameron.Campbell@conservation.ca.gov

The Santa Barbara Record of Two Volcanic Winters Triggered by Twin Yellowstone Supervolcano Eruptions 631,000 years ago
Presented by: Rick Behl, California State University, Long Beach

Abstract: Large historic volcanic eruptions like Tambora (1816) or Krakatoa (1883) influenced the composition of the upper atmosphere and changed the radiation balance of the entire Earth. These produced the "year without summer" and fabulous crimson-hued sunsets immortalized in paintings from the 19th century. It is postulated that much larger supervolcano eruptions like Toba (74 ka) would produce even greater, global "volcanic winter" effects. Researchers have created computer models of the possible effects, but there is scant data on the actual result of such catastrophic eruptions.

A sedimentary paleoclimate record from Santa Barbara Basin, California provides an unprecedented high-resolution climatic history of the last Yellowstone supervolcano eruption, one of the largest of the Quaternary. The Lava Creek B ash (631.3 +/- 4 ka), identified by its unique geochemical fingerprint, occurs as two thin tephra layers, distinct in sediment composition and particle size from the background organic-rich hemipelagic mud. This ash fall deposit, widely distributed over western North America, records the massive explosive volcanic episode that formed the present vast Yellowstone volcanic caldera. For the first time, this tephra has been directly compared with a climatic record with decadal resolution that demonstrates that the volcanism was precisely coincident with, and therefore likely the cause of, two episodes of abrupt sea-surface cooling of ~3 degrees C in Santa Barbara Basin. Each of these volcanic winters lasted at least 80 years, far longer than predicted by computer models based on atmospheric dust and sulfur loads, and started and stopped rapidly. These results suggest involvement of strong, positive climatic feedbacks including surface albedo, ice and oceanographic effects.

Biography: Richard Behl is Professor and Chair of the Department of Geological Sciences at CSU Long Beach, and Director of the MARS Project (Monterey And Related Sediments) industrial affiliates program. Rick earned his Bachelor's degree from the University of California (UC) San Diego, his PhD at UC Santa Cruz, and was a Post-Doctoral Fellow at UC Santa Barbara. His expertise is in the sedimentology and sedimentary petrology of hemipelagic and pelagic sediments, and their relationship to climatic, oceanographic, and tectonic change. Behl's research focuses on the Quaternary Santa Barbara Basin and the petroliferous Miocene Monterey Formation. He has written more than 50 scientific articles and one controversial book. Rick was an AAPG Distinguished Lecturer, was named a Distinguished Educator and elected President of the AAPG-Pacific Section, a Fellow of the Geological Society of America and given lifetime Honorary Membership in the Society for Sedimentary Geology-Pacific Section.

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