LOS ANGELES BASIN GEOLOGICAL SOCIETY

April 2025 Newsletter

Geochronologic Analysis of the Fold-Thrust-Belt Growth within the Argentina Pre-Cordillera

Vincent Ruiz
CSU Long Beach M.S. Geology Candidate

Thursday, May 15th,
Attitude Adjustment 6:00 PM, Talk begins around 7:00 PM
Four Sons Brewing, 18421 Gothard Street, Suite 100
Huntington Beach
The Barrel Room – opposite side of the bar & eating area
For Out-of-Towners, a Virtual Attendance Option is Available – See Below!

Abstract

Foreland basins, gathering sediment from rivers draining adjacent fold-thrust-belts, preserve important records of tectonic and climatic changes such as fault growth, exhumation, continental aridity, and storm intensity. The Bermejo Basin, fed by the Rio Huaco, Rio Jachal, and Rio San Juan, is a broken foreland basin located in the eastern Pre-Cordillera, San Juan, Argentina. Fault and fold propagation from the Miocene to present has contributed to erosion, deposition, and burial followed by subsequent exhumation and erosion. Work in the northern section of the basin (Huaco) attributes late-Miocene and Pliocene changes in paleo-erosion rates to increased continental aridity. However, this interpretation does not consider active thrusting on several faults in the eastern Pre-Cordillera, which could also influence sedimentation in the basin. Fault growth and propagation in this region appears to be significant and complex, with out-of-sequence thrusting, back thrusting, and propagation along strike. Therefore, we consider that paleo-erosion and depositional signals could be varied across the basin. We use cosmogenic radionuclide (CRN) dating, paleomagnetic

stratigraphy, U-Pb geochronology in the Quebrada del Cura, Rio Jachal, Mogna, and El Corral formations, in the central Bermejo Basin (Mogna) to compare paleo-erosion rates with the northern section (Huaco) to deconvolve signals between tectonic and climate controls on basin sedimentation. CRN data reveals that the base of the Mogna fm. near Huaco (north) is 5.15 ± 0.33 Ma and near Mogna (central) is 4.59 ± 0.65 Ma. The northern section age (Huaco) is 2 m.y. older than previously suggested and the central section (Mogna) age is similar to that of previous work. These new results imply there may be a need to reassess the interpretation of continental aridity as the main driver of paleo-erosion rate changes. Be^{10} ages from 25 CRN, paleo-magnetic samples, and U-Pb geochronology provide a robust dataset to approach questions about paleo-erosion rate changes in the Bermejo Basin. By comparing our new findings to ongoing work constraining the spatiotemporal changes on the easternmost thrust faults of the Pre-Cordillera, we can determine the role faulting may play on basin sedimentation changes and interpreting basin records

Biography

Vincent Ruiz attended Cal Poly Pomona as an undergraduate geology major with an emphasis in hard rock geology. During his time as an undergraduate, Vincent took part in two research projects. The first project investigated the cause of the metamorphism northwest of the Calico Mountain Range in Calico, California. The second dealt with the geomorphic and geochemical analysis of the volcanic chain in coastal San Luis Obispo County, California, nicknamed the "Nine Sisters". The goal of the project was to delineate and distinguish, if possible, the geochemical composition within the nine major volcanic formations. Vincent is currently finishing up his Master of Science in Geology at California State University, Long Beach. His area of study presented at the meeting used disparate geochronological methods for analysis of the fold-thrust-belt growth within the Argentina Pre-Cordillera. Upon graduation, Vincent plans to head into industry for a year with the idea of applying to a PhD program to continue studies in geochronology.

Dinner & Voluntary Donation

You will order from the Four Sons menu directly and pay for your meal and drink.
The LABGS Executive Committee respectfully requests a $10 per person donation to the Society at the Dinner Meeting. Students are exempted from the donation request.
With this donation you are giving through the Society in support of our annual scholarship fund. The Pacific Section AAPG matches our scholarship contributions which results in significant annual support for geology majors – to help defray or cover costs for field camp, tuition, rent, etc. Our Scholarship Chair, Karla Tucker, will be happy to explain the details of the annual event of awarding the scholarships to grateful students – just ask!

Reservations are required by noon, May 12th, at labgs.org/meeting_info.html or directly contact LABGS Secretary Joseph Landeros at (626) 497-1710 or landerosjd@gmail.com.

Virtual Attendance on Zoom

A virtual option will be available for those who cannot attend in person for the January talk. See below for a new link. We plan to offer Zoom for all talks in the foreseeable future.

To Join the Zoom Meeting:
https://csulb.zoom.us/j/88206836217
Meeting ID: 882 0683 6217

Meeting Acoustics

The executive committee is aware of the relatively poor acoustics in our new venue at Four Sons Brewing. No amount of beer seems to overcome this issue. At the April meeting, anticipating this need, we tried a solution for using a Bluetooth-enabled microphone with an external speaker. Unfortunately, this didn't work due to technical reasons. We are continuing in our quest to raise the volume such that peripheral attendees can hear the speaker without requiring a fair bit of yelling on the speaker's part. We are not so proud as to refuse good ideas. If you have experience in this technological-acoustic niche, then we are happy to hear you out. Please email any of the Committee members below if something comes to mind. Meanwhile, we will see everyone this Thursday evening!

What Are You Doing This Summer?

Ideally, we will have our dinner meetings through the summer! The rub will be on some nights we will need to move the meeting up a day or two to accommodate bookings of our venue at Four Sons. Stay tuned for these meeting announcements. One idea out of the ordinary would be to hold an outdoor meeting at a park with trails, interesting geology nearby, and BBQs, where we could BYOB and BYOF for a community cook out/hang out – just a thought. Stay tuned!

"Success is merely one achievement that covers up a multitude of blunders."

- *George Bernard Shaw (1856 – 1950*)

Field Report

Southeastern San Grabriel Mountains - looking down and east-southeast at the Deer Creek Canyon & Wash towards Rancho Cucamonga, approximately 1,000' below. The Jurupa Hills occupy the left side, middle distance. The low hills in the center-middle distance separate Riverside (left) from Norco (right). The Santa Ana Mountains define the far horizon. The local water district operates facilities in this area for the ground water resource. The near-symmetrical slopes flanking the wash, at the apex of the extensive Deer Creek Quaternary-Pleistocene alluvial fan complex, are composed of Precambrian(?) gneiss, retrograded to amphibolite and greenschist facies, according to Douglas Morton and Jonathan Matti of the U.S.G.S. See their descriptions on these super-ancient rocks along with the others here (LINK), from their online publication of the map and descriptions in 2001. Their joint field mapping effort in this area ran from 1970 to 1989.

LABGS Board Members