ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS

INLAND EMPIRE CHAPTER

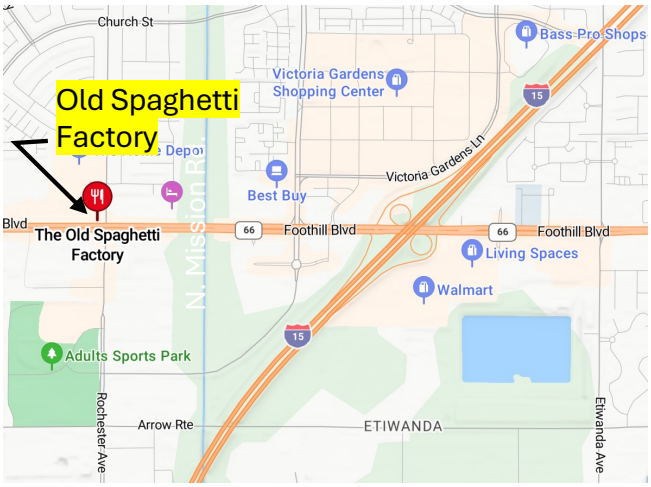
MAY 2025 MEETING ANNOUNCEMENT

Greetings AEG Inland Empire Chapter Members

We hope you will join us for our fifth 2025 AEG Inland Empire meeting. The meeting will be held Wednesday, May 14, at the The Old Spaghetti Factory in Rancho Cucamonga. This a "NORTH" venue of our roving AEG-IE meeting locations. Looking forward to seeing you there!

Meeting date:
Wednesday, May 14, 2025

Location: **The Old Spaghetti Factory**
11896 Foothill Blvd
Ranch Cucamonga, CA 91730



Time: 5:30 pm Social Hour
6:30 pm Dinner
7:30 pm Presentation

Cost: $45 per person with advance reservations for AEG members,
$50 without reservations (at the door) and non-members,
$10 for students with a valid student ID and current AEG Student membership.

Food: Food from The Old Spaghetti Factory.

RSVP: **Register and pay online in advance at our website aeg-ie.org**
Note: This is a change, and we are no longer accepting RSVPs by email.

Please make reservations prior to Noon 12 p.m., Monday, May 12

Speakers:

Student Speaker Night

Speakers from UC Riverside and CSU San Bernardino

Jacob Baker	Caroline Hung	Jose Jimenez	Andre Mere
CSUSB	UCR	CSUSB	UCR

See more presentation details on following page

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Student Speaker Night
Speakers from UC Riverside and CSU San Bernardino

Exposure age and geomorphic study in the Outback Nunataks, East Antarctica

Jacob Baker

MS Student, Geological Sciences, California State University San Bernadino

ABSTRACT

We are investigating the history of ice sheet surface elevation at the Outback Nunataks in East Antarctica with geomorphic mapping and exposure age dating. Weathering of bedrock surfaces and density of glacial features vary at altitudes along the nunataks, depending on the history of ice sheet coverage. Geomorphic mapping and field observations of the Roberts Butte, Miller Butte, and Frontier Mountain, in the Outback Nunatak range, using 2023 Landsat Image Mosaic of Antarctica (LIMA), assists us in identifying landforms that have been shaped by past glaciations. We sampled bedrock and glacial erratics from two nunataks for cosmogenic nuclide analysis: Roberts Butte (2750 m asl) and Miller Butte (2555 m asl), where bedrock lithology is predominantly the Granite Harbor Intrusive Complex. Apparent bedrock exposure ages indicate that the ice sheet has not overridden Roberts Butte in at least 4 Ma and glacial erratic exposure ages will provide insight to when the ice sheet was imposed at a higher altitude than the modern-day ice sheet. Paleo-ice sheet elevations are important to constrain models of East Antarctic ice sheet retreat, which is not as clearly defined as the West Antarctic ice sheet. The East Antarctic ice sheet has the potential to contribute 53.3 m of eustatic sea level rise if completely deglaciated, holding serious implications for coastal communities and other systems on the planet.

BIOGRAPHY

Jacob is working towards completing his MS in Geology at CSUSB and has aspirations to be a teacher and educate the next generation of geology majors! While his thesis topic (ice sheet coverage) is niche to SoCal geology, he also enjoys topics of mineralogy, coastal geomorphology, and tectonics. In his free time, Jacob enjoys cooking for family and hiking outdoors.

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Monitoring Water Quality during the Rapid Shallowing of the Salton Sea, California's Largest Lake

Caroline Hung

PhD Candidate, Earth and Planetary Sciences, University of California Riverside

ABSTRACT

A century of policy decisions has dramatically shaped California's largest lake, the Salton Sea—a water body primarily sustained by untreated agricultural runoff. Since the 2003 Quantification Settlement Agreement, accelerated water level recession has intensified existing water quality challenges, including harmful algal blooms driven by nutrient loading and rapidly increasing salinity. My research addresses a critical monitoring gap by documenting these deteriorating water quality conditions through field and lab work when most official monitoring programs have been discontinued. The findings on nutrients, lake stratification dynamics, sulfur cycling and trace metal chemistry demonstrate why rehabilitating the lake's water quality is not merely an environmental concern but an urgent public health imperative for protecting air quality and community wellbeing throughout the region.

BIOGRAPHY

Caroline Hung is a PhD candidate in UC Riverside's Earth and Planetary Sciences Department. As a biogeochemist, she excels in fieldwork and laboratory analytics, tracking the flow of major and trace elements through ecosystems—particularly in polluted and anthropogenically-modified systems. Her research has taken her across diverse landscapes from Southern California and upstate New York to British Columbia, Canada, and New Zealand's South Island.

With a strong focus on science policy, Caroline consistently seeks to maximize the societal impact of her research. This includes extensive outreach and stakeholder engagement related to her Salton Sea water quality research, which has garnered media attention. For three years, she served as a Graduate Student Representative through the Bonnie Reiss Climate Action Fellowships in the University of California Office of the President's Global Climate Leadership Council. Her contributions there helped shape the UC system’s electrification roadmap toward 90% carbon reduction by 2045.

As Caroline completes her PhD this August, she is exploring new opportunities to continue her environmental work...

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The Impact of Debris Cover on Emmons Glacier, Mount Rainier, WA

Jose Jimenez

MS Student, Geological Sciences, California State University San Bernadino

ABSTRACT

Mount Rainier is a stratovolcano in the Cascade Range that hosts 28 glaciers including the debris-covered Emmons Glacier. Emmons Glacier is located on the northeastern side of Mount Rainier and is the largest glacier in the contiguous United States by area and volume. It is concerning that a significant decline in glacier area and volume for Mount Rainier glaciers has been documented by Beason et al. (2023), where they calculated a 41.6% reduction in glacier area at Mount Rainier over the last 125 years. Emmons Glacier has a long record of remote and ground-based observations of the glacier surface. The relatively rapid recession of Emmons Glacier offers a unique opportunity to observe changes in glacier surface morphology. In this study, we use our remote sensing techniques such as digitization of glacier areas from 1951 to 2023, Digital Elevation Model (DEM) differencing, and 'Geomorphon Landforms' to study the evolution of Emmons Glacier. Additionally, manually excavated pits on the debris-cover provides insights into how rock cover can hinder or accelerate melt. Understanding changes in debris-covered glaciers is crucial due to their complex response to climate change which is evident over the last 72 years in Emmons Glacier's evolution.

BIOGRAPHY

Jose Eduardo Jimenez is a Master's student in Geology at California State University San Bernardino (CSUSB), where he combines remote sensing technologies with field-collected data to analyze terrestrial glaciers and draw parallels to cryospheric processes on Mars. Jose began his journey at Riverside City College, earning an Associate of Science before transferring to CSUSB. There, he completed his Bachelor of Arts in Geology, cultivating a foundation in geospatial analysis and Earth processes.

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From collision to subduction: thermal-kinematic inversions constrain plate boundary structure and dip-slip activity in southwestern New Zealand

Andre M. Mere

GIT, PhD Candidate, Earth and Planetary Sciences, University of California Riverside

ABSTRACT

Constraints on three-dimensional fault system geometry and kinematics are required to understand both long-term tectonics and contemporary seismic hazard. In many cases, these parameters must be inferred from a combination of different data or analyses. Here, we invert low-temperature thermochronological data to quantitatively parameterize both the crustal-scale geometry and late Cenozoic dip-slip kinematics of the plate boundary system in southwest New Zealand. We find that the modern transpressive plate boundary system has accommodated the bulk of Australian-Pacific Plate convergence since establishment in the middle Miocene-early Pliocene. Shortening has occurred via (i) dextral-reverse slip on the moderate angle, listric central Alpine Fault décollement, and (ii) reverse-slip on either the sharply curved, anti-listric northern Puysegur Subduction interface or low-angle offshore thrust fault system that splays from the high-angle southern Alpine Fault at depth. We resolve indistinguishable late Cenozoic shortening rates on these structures and interpret this to reflect the transfer of convergent deformation outboard of the strike-slip southern Alpine Fault. Our work helps elucidate the transition from strain localized oblique continental collision to strain partitioned subduction. We also provide an estimate of the across-strike width of the central-southern Alpine Fault section boundary at seismogenic depth. This is the first quantitative constraint on the geometry of a structural feature inferred to have arrested several major prehistoric earthquakes. This study furthers understanding of fault structure and dip-slip kinematics along the greatest sources of seismic hazard in and offshore of southwest New Zealand.

BIOGRAPHY

Andre Mere is a sixth-year PhD candidate in active tectonics and tectonic geomorphology at the University of California Riverside. Under the supervision of P.I. Nic Barth (UCR) and mentor Devin McPhillips (USGS), Andre has published studies examining Quaternary fault activity along both the Sierra Madre-Cucamonga Fault Zone in Southern California, and the Alpine Fault in New Zealand. Andre has a broad range of expertise that includes quantitative landscape analysis, Quaternary and deep-time geochronology, low-temperature thermochronology, numerical methods, and Bayesian inversion. From mid-June onwards, Andre will continue researching active fault systems as a Sr. Staff Geologist at Lettis Consultants International.