

Inland Geological Society

October 2025

Next Meeting:

**Tuesday,
October 14th**

Time:

Social: 6:00pm

Dinner 6:15pm

Presentation:
7:00pm

Location:

3 Iron
Brewing Company
898 South Via Lata,
Suite A
Colton, CA 92324

Coming to Dinner?

Students \$10
IGS Members \$12
Non-Members \$15
Please RSVP by
October 10th to:

rsvp.igs@gmail.com

Newsletter of the Inland Geological Society Volume 37 No. 8

In this issue:

- October Speaker: Terry Li 1-2
- Announcements / Upcoming Events 2
- IGS Meeting Schedule 2
- Meeting Location & Current IGS Officers 3

October Speaker: Terry Li

"A LiDAR-Based Bedrock Landslide Inventory of the San Gabriel Mountains, California"

Abstract:

The San Gabriel Mountains (SGM) are one of the most tectonically active mountain ranges in the U.S., yet a comprehensive LiDAR-based landslide inventory (LSI) has not been completed at the range scale. This study presents a novel, high-resolution LSI of the SGM using 1 m LiDAR multi-hillshade imagery, mapping nearly 12,000 bedrock landslides and analyzing their relationships with geology, topography, tectonic blocks, and landslide susceptibility. Results show that crystalline rocks host the majority of large landslides, supporting prior hypotheses that stronger rocks can produce larger landslides. Landslides sourced in schist display disproportionately high abundance and distinctive morphology, with internally deformed, topography-mantling deposits that differ from more blocky, coherent failures in other lithologies. Fault-bounded structural blocks show varied landslide behavior, with notably high landslide density along the range-front area, suggesting possible reactivation of the San Gabriel Fault or complex deformation within the Sierra Madre and Tujunga blocks. While landslide density generally increases with landslide susceptibility (He & Beighley, 2008), the distribution deviates from an expected linear trend suggesting potential to improve landslide susceptibility and hazard models. A region of Tertiary volcanics stands out for its disproportionately high density of landslides, including a $>1 \text{ km}^2$ deposit, highlighting complex multi-factor influences. Comparison of landslide deposit and lineament density reveals little correlation in the western SGM, but strong positive correlation in the east, likely due to lithologic and geomorphic controls. Observations made in this study suggest that Holocene-scale rates of $>1 \text{ km}^2$ landslide rates share similarities to those estimated by Lave & Burbank (2004), but may be underestimated as the topographic expression of bedrock landslides can be removed over Holocene timescales. Findings made by this study underscore the need for further refinement of geologic mapping, susceptibility models, and tectonic investigations to better assess landslide hazards in active orogens such as the SGM.

Speaker Biography:

Mr. Li recently defended his thesis for his MSc in Geology at the University of California, Riverside and also received his BS in Geology at the same university. He is interested in understanding the processes that drive change of Earth's diverse landscapes. For his thesis, he utilized high-resolution LiDAR imagery to manually identify and map the extents of bedrock landslides, as well as lineaments generated by slope failure, across the entire San Gabriel Mountains and generated basic statistics regarding bedrock landslides and potential influencing factors. This presentation will go over the results of his thesis.

ANNOUNCEMENTS:

The Inland Geological Society will meet the second Tuesday of each month at:

3 Iron Brewing Company

898 South Via Lata , Suite A

Colton, California 92324

(<https://www.3ironbrewingco.com>)

Not to interfere with Veteran's Day, our next meeting is scheduled for Tuesday, November 4, 2025.

Visit our:

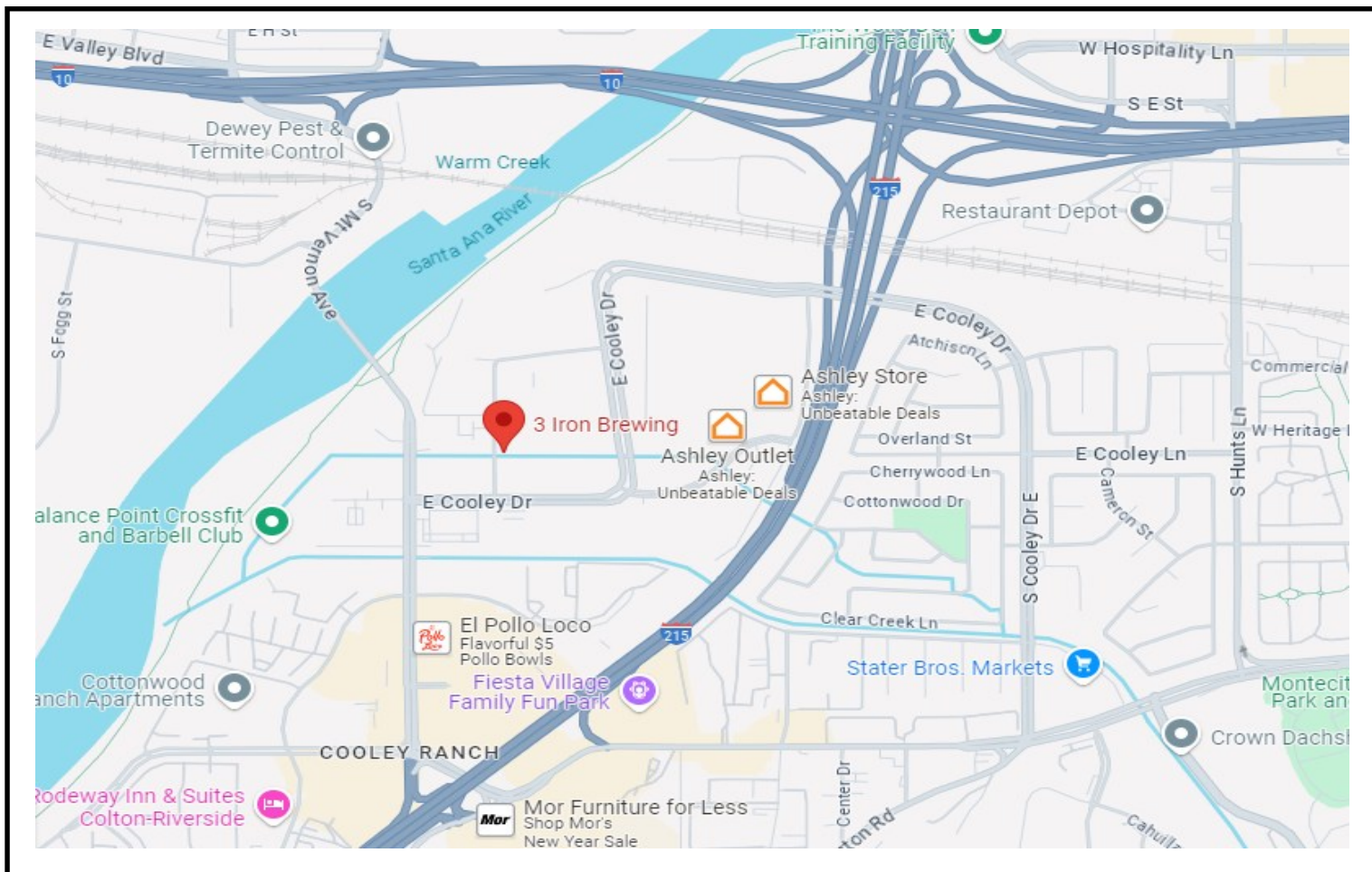
- Webpage at <https://www.inlandgeo.org/>.
- Facebook Page at <https://www.facebook.com/groups/InlandGeo/>.

IGS coffee mugs are available at the monthly meetings for \$10. Get yours at the upcoming meeting!



3 Iron Brewing Company

898 South Via Lata , Suite A
Colton, California 92324



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