

# **Faults and Films: How California's faults generate the backdrop for famous movies and TV shows**

## **Field Seminar Guide**

### **Overview**

Southern California is renowned for its entertainment industry, but as earth scientists, we know the real stars of Los Angeles are beneath our feet. The dramatic topography that drew early filmmakers to this region including rugged mountains, sweeping coastlines, and arid deserts is the result of a highly active and complex tectonic setting. From the continual motion along the San Andreas plate boundary to the complex network of faults uplifting the Transverse Ranges, the local geology has served as the ultimate, dynamic backdrop for a century of cinema.

While you are in town this April, we encourage you to take some time outside of the session rooms and explore the spectacular geology that makes up the meeting's backyard. This guide highlights a selection of iconic filming locations in and around the Los Angeles area that double as geologic field sites. Whether you are looking to examine the dramatic tectonic tilting of the Vasquez Formation, observe active petroleum seeps, or trace the forces that shaped Malibu's coastline, there is a site here for you.

Visiting one or more of these locations offers a unique way to experience the culture of Southern California while getting up close with the stratigraphy, geomorphology, and structural geology that define it. I hope you take some time before or after the meeting to enjoy the intersection of faults and films.

Enjoy the sessions and happy exploring!

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*Co-Chairs, 2026 SSA Annual Meeting*



## 1. Vasquez Rocks Natural Area Park

- **Location:** 10700 Escondido Canyon Road, Agua Dulce, California 91390 (~45 minutes; 34.4855° N, 118.3173° W)
- **Geology:** Vasquez Rocks features jagged hogback ridges created by 25-million-year-old sandstone and conglomerate layers known as the Mint Canyon Formation. These strata were deposited in a rapidly subsiding basin and later highly tilted (at angles over 50 degrees) and exposed due to intense tectonic uplift along the Elkhorn Fault, an offshoot of the San Andreas Fault system. Differential erosion of the tilted beds has left the resistant sandstone beds jutting into the sky.
- **On Screen:** *Star Trek* (multiple episodes and films, famously serving as the planet Vulcan or the site of Kirk's battle with the Gorn), *Blazing Saddles*, *The Flintstones*, and *Bill & Ted's Bogus Journey*.
- **Additional Information:**
  - On your way to Vasquez rocks, you will cross the San Andreas Fault from the Pacific Plate to the North American Plate. A spectacular view of the fault can be seen in a road cut along Hwy 14 near Palmdale (take care when driving!): <https://strike-slip.geol.ucsb.edu/KESSEL/palmdaleroadcut.html>
  - *Geologic Map of the Agua Dulce Quadrangle, Los Angeles County, California* by T.W. Dibblee (1996). [https://ngmdb.usgs.gov/Prodesc/proddesc\\_71691.htm](https://ngmdb.usgs.gov/Prodesc/proddesc_71691.htm)
  - Coffey, K.T., Ingersoll, R.V., Schmitt, A.K. (2019). Stratigraphy, provenance, and tectonic significance of the Punchbowl block, San Gabriel Mountains, California, USA. *Geosphere* 15 (2): 479–501. doi: <https://doi.org/10.1130/GES02025.1>



Vasquez Rocks County Park near Santa Clarita, Calif. (Source: Wikipedia)

## 2. La Brea Tar Pits

- **Location:** 5801 Wilshire Blvd, Los Angeles, CA 90036 (~30 minutes; 34.0628° N, 118.3558° W)
- **Geology:** This is one of the world's premier Ice Age fossil sites. Heavy fractions of crude oil from the underlying Salt Lake Oil Field migrate to the surface via fractures associated with the 6th Street Fault. As the lighter components evaporate, a sticky asphalt remains, trapping and preserving the remains of Pleistocene megafauna like saber-toothed cats, dire wolves, and mammoths for tens of thousands of years.
- **On Screen:** *Volcano* (featured as the epicenter of the eruption), *Miracle Mile*, and *Last Action Hero*.
- **Additional Information:**
  - The La Brea Tar Pits & Museum maintains extensive open-access research publications on the site's stratigraphy and the 6th Street Fault.
  - Dibblee, T.W., and Ehrenspeck, H.E. (1991). *Geologic Map of the Hollywood and Burbank (South Half) Quadrangles*. [https://ngmdb.usgs.gov/Prodesc/proddesc\\_215.htm](https://ngmdb.usgs.gov/Prodesc/proddesc_215.htm)
  - Woodard, G. D., & Marcus, L. F. (1973). Rancho La Brea Fossil Deposits: A Re-Evaluation from Stratigraphic and Geological Evidence, *Journal of Paleontology*, 47(1), p. 54-69, *JSTOR*. <http://www.jstor.org/stable/1302866>
  - Wright, T. (1987). Geological Setting of the Rancho La Brea Tar Pits, *Petroleum Geology of Coastal Southern California*, p. 87-91.



(Left) The Tar Pits in 1910. Oil derricks can be seen in the background. (Right) Illustration of several species getting mired in the tar pits. (Source: Wikipedia)

### 3. Bronson Caves

- **Location:** Griffith Park, 3200 Canyon Dr, Los Angeles, CA 90068 (~20 minutes; 34.1227° N, 118.3152° W)
- **Geology:** Located in the southwest section of Griffith Park near the north end of Canyon Drive, the "caves" are actually man-made tunnels from a 1903 crushed rock quarry. The site offers a look at the local bedrock of the Santa Monica Mountains that are a mix of middle Miocene sedimentary and metamorphosed volcanic rocks. The site sits just north of the Hollywood Fault, an active left-oblique reverse fault zone that marks the boundary of the Transverse Ranges. The quarrying left behind vertical walls and a tunnel that mimics a natural cave entrance making it a useful filming site.
- **On Screen:** The Batcave in the 1960s *Batman* television series, *Invasion of the Body Snatchers*, *Army of Darkness*, *Friday the 13th Part VI: Jason Lives*, *Hail, Caesar!*, and *Star Trek*.
- **Additional information:**
  - Yerkes, R.F., and Campbell, R.H. (2005). *Preliminary Geologic Map of the Los Angeles 30' x 60' Quadrangle, Southern California*, USGS Open-File Report 2005-1019, <https://pubs.usgs.gov/of/2005/1019/>
  - Yerkes, R. F., & Campbell, R. H. (1979). Stratigraphic Nomenclature of the Central Santa Monica Mountains, Los Angeles County, California, USGS Bulletin 1457-E, <https://pubs.usgs.gov/bul/1457e/report.pdf>
  - Catchings, R.D., Hernandez, J., Goldman, M.R., Chan, J.H., Sickler, R.R., Olson, B., and Criley, C.J. (2020), 2018 U.S. Geological Survey–California Geological Survey Fault-Imaging Surveys Across the Hollywood and Santa Monica Faults, Los Angeles County, California, USGS Open-File Report 2020-1049, 42 p., <https://doi.org/10.3133/ofr20201049>.



Looking out from one of the Bronson Canyon quarry entrances. (Source: <https://recreation.parks.lacity.gov/park/bronson-canyon>)

#### 4. Point Dume Nature Preserve

- **Location:** Point Dume Natural Preserve, Birdview Ave, Malibu, CA 90265 (~1 hour; 34.0015° N, 118.8068° W)
- **Geology:** Point Dume owes its prominence to the Miocene-era Conejo Volcanics. These dense igneous rocks form a durable headland that resists wave erosion much better than the surrounding sedimentary strata. The area is heavily influenced by the Dume Fault, a left-oblique reverse fault that runs just offshore, contributing to the uplift of the spectacular marine terraces and steep cliffs visible from the beach.
- **On Screen:** *Planet of the Apes* (1968—the iconic Statue of Liberty ending), *The Big Lebowski*, and *Iron Man* (the CGI location of Tony Stark's cliffside mansion).
- **Additional information:**
  - Campbell, B.A., Blackerby, B.A., Yerkes, R.F., Schoelhamer, J.E., Birkeland, J.E., and Wentworth, C.M. (1996). *Geologic Map of the Point Dume Quadrangle, Los Angeles County, California*, Geologic Quadrangle 1747, <https://doi.org/10.3133/gq1747>
  - Dolan, J.F., Sieh, K., and Rockwell, T.K. (2000). Late Quaternary activity and seismic potential of the Santa Monica fault system, Los Angeles, California: *Geological Society of America Bulletin*, v. 112, p. 1559-1581. [https://doi.org/10.1130/0016-7606\(2000\)112%3C1559:LQAASP%3E2.0.CO;2](https://doi.org/10.1130/0016-7606(2000)112%3C1559:LQAASP%3E2.0.CO;2)



*Cliff at Point Dume State Beach (Source: Wikipedia)*

## 5. Leo Carrillo State Park

- **Location:** 35000 West Pacific Coast Highway, Malibu, CA 90265 (~1.25 hour; 34.0461° N, 118.9321° W)
- **Geology:** This stretch of coastline offers a fantastic display of coastal geomorphology. The caves, tunnels, and arches were carved out by wave action exploiting weak points such as fractures, joints, and small fault lines in the Point Dume Volcanics and Trancas Formation sedimentary rocks.
- **On Screen:** *Inception*, *The Usual Suspects*, *Grease*, *The Karate Kid*, *Pirates of the Caribbean: The Curse of the Black Pearl*.
- **Additional Information:**
  - NPS Geodiversity Atlas—Santa Monica Mountains National Recreation Area, California, <https://www.nps.gov/articles/nps-geodiversity-atlas-santa-monica-mountains-national-recreation-area-california.htm>
  - Dibblee, T.W., and Ehrenspeck, H.E. (1990). Geologic map of the Point Mugu and Triunfo Pass quadrangles, Ventura and Los Angeles Counties, California, Dibblee Foundation Map DF-29, [https://ngmdb.usgs.gov/Prodesc/proddesc\\_184.htm](https://ngmdb.usgs.gov/Prodesc/proddesc_184.htm)



View from Leo Carrillo State Park's sea cave. (Source: Wikipedia)