Hollister Hills SVRA

State Vehicular Recreation Area

Two Worlds Collide

The earth's crust is composed of tectonic plates that slowly slide over the earth's viscous, fluid mantle. These plates, composed of either oceanic crust or continental crust, meet in different ways. They may mash together, such as where the Indian plate has pushed into the Eurasian plate, creating the Himalayas. Or an oceanic plate may slip underneath another plate, creating a subduction-related volcanic arc. The Cascade Range is a volcanic arc, which stretches from northern California through Oregon and Washington and into British Columbia, and includes Mount St. Helens, among other active volcanoes. Or the plates may slide past each other along what is called a transform margin, such as along California's San Andreas Fault. South of the town of Hollister and due east of the Monterey Bay, within the hills and peaks of the Gabilan Range, the Hollister Hills State Vehicular Recreation Area (Hollister Hills) straddles a portion of the San Andreas.

Process: Active faulting

What you can see:
linear valleys, shutter ridges, offset channels, soil and topographic contrasts

San Andreas Fault

The San Andreas Fault is a transform margin between the Pacific oceanic plate and the North American continental plate. The San Andreas Fault extends over hundreds of miles from the Gulf of California to Shelter Cove near Cape Mendocino. Geomorphic features indicative of active strike-slip (lateral) movement along the fault zone include elongate hills known as pressure ridges or, where they block drainages, shutter ridges. Offset drainages are another common fault-generated feature at the park.

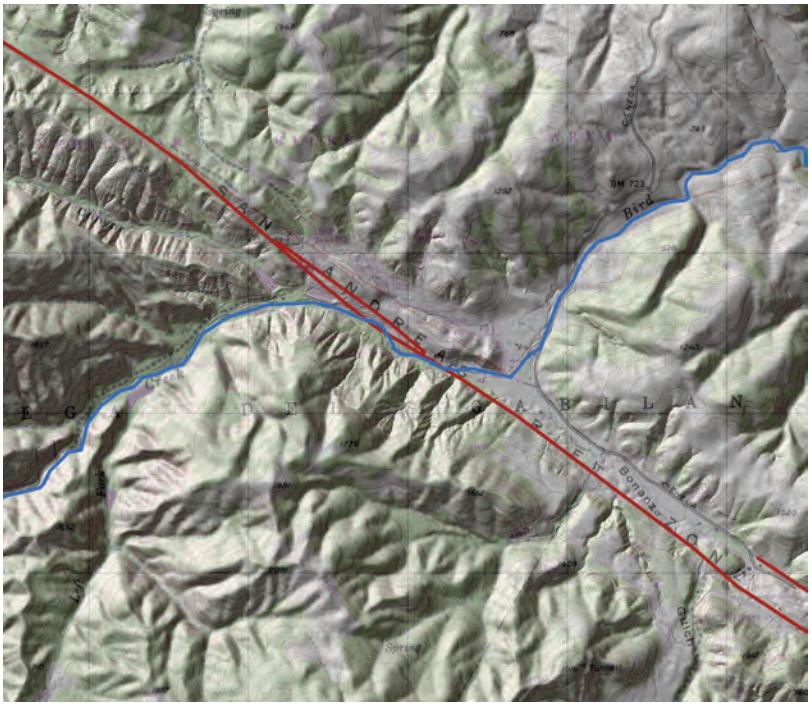
Movement along this fault is, of course, exhibited by earthquakes, from small shakers to devastating events, such as the famed 1906 San Francisco quake. There are also portions of the fault where the plates quietly slide, or creep, past each other. This occurs on that portion of the San Andreas Fault which runs through Hollister Hills.

Fault creep sounds relatively innocuous. Indeed, fault creep instruments installed at Hollister Hills have recorded movement of about one half inch for every year. But fault creep is relentless, and movement on the San Andreas Fault began millions of years ago. The resultant effect of the strike-slip movement, in the Hollister Hills landscape is dramatic.

For instance, the northwest-southeast trace of the San Andreas Fault is delineated by the shallow, linear valley that stretches between the Lower Ranch and Upper Ranch areas of Hollister Hills.

Linear hillocks within the valley, such as Radio Ridge in the Lower Ranch and the hills between Cienega Road and the grand prix track in the Upper Ranch, are aligned along a northwest path and are called shutter ridges, created by the slow seismic smearing

Why it's important: The landforms and underlying geology found at Hollister Hills embody a dynamic history of shifting tectonic plates—giant fragments of the earth's crust. The park is situated at the active continental margin, where the Pacific plate and the North American plate are moving slowly past each other along the San Andreas Fault. East of the fault, rocks of the Franciscan Complex form the core of the central California Coast Ranges. To the west, rocks of the Salinian terrane represent a displaced block of the earth's crust that has been dragged northward along the fault over millions of years.



The red line shows the San Andreas Fault which has offset the course of Bird Creek, the blue line. The creek flows from left to right

An excellent example is Bird Creek, which flows northeast from the southern corner of the Lower Ranch. The creek is diverted more than 4,000 feet southwest along the fault trace before continuing northeast near the main entrance of Hollister Hills on Cienega Road.

between the plates. And drainages—both manmade and natural—that flow across the fault have been offset. A concrete canal at the DeRose Vineyards, just up Cienega Road, southeast from the Upper Ranch, displays more than three feet of right-lateral offset. The historic DeRose corking facility near the canal also straddles the fault and has been literally torn in two, due to the plate movement. It has been retrofitted to function as two separate structures.

There are two different landscapes at Hollister Hills. The topography is higher and steeper southwest of the San Andreas Fault trace, and the vegetation is relatively dense and varied. Northeast of the trace, the topography is muted, softer, the hills more rounded and the sparse vegetation consists mostly of oak woodland, scrub, and grasses. This is the result of the slow northwest progression of the Pacific plate relative to the North American plate along the San Andreas Fault.

The higher and steeper hills southwest of the fault trace are underlain by granitic rock and relatively minor amounts of metamorphic rock. Known as the Salinian terrane (named after the nearby town of Salinas), the granitic rock is at least 145 million years old and is likely the southern extension of the Sierran granitic intrusion—the rocks that comprise the spine of the Sierra Nevada. The rock beneath the rolling hills on

the northeast side of the fault consists of much softer and younger siltstones and sandstones derived from sediments deposited in a near-shore environment. These rocks are approximately five to six million years old.

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The soils that develop from the rock southwest of the fault trace are significantly different from the soils derived from the rock northeast of the fault. In the granitic terrain, the rock is hard but may be brittle and easily crumbled (friable) where exposed. Its light-colored soils are sandy and silty and drain well, but they mostly lack cohesion due to an absence of clay. These soils are more vulnerable to erosion, particularly from runoff concentrated in a ditch or gully.

The younger, softer sedimentary rock northeast of the San Andreas Fault crops out in few places because it quickly weathers to a dark brown to black, clay-rich soil.

The contrasts can be readily seen from the air. The soil and terrain either side of the fault provide different habitat for plants and animals.

Final Thoughts

The geology of Hollister Hills presents a unique recreational choice to the off-highway vehicle enthusiast—whether to explore the Pacific plate, the North American plate, or both.

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