

## History of Exploration and Development of the Ventura-Santa Barbara Basin

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### Abstract

The Ventura and Santa Barbara basins have been in the spotlight of Pacific Section conferences, seminars, field trips, and publications for much of the Section's 100-year history. These basins have been seeping oil to the surface for millennia and have been one of the most important oil producing regions in the United States. Hydrocarbons have played an important role in the economic development of the area. Oil exploration and production in this region has also been at the forefront of many environmental movements and has impacted both national, state, and local laws and policies.

The earliest use of hydrocarbons dates back many thousands of years. Native Chumash tribes utilized seaworthy canoes (tomolo'o) caulked with tar from hydrocarbon seeps to exploit the many resources along the coast and the northern Channel Islands. Many of the early European settlers made note of these uses and the natural occurrence of hydrocarbons at the surface. By the 1860's tunnels were dug at Sulphur Mountain near Ojai to collect oil.

The late 1800's saw numerous attempts to drill wells to develop these resources. The Pico Canyon oilfield was the site of numerous oil seeps and the first commercially successful well drilled in California in 1876, but many other attempts in the Ventura-Santa Barbara basin were less successful. Wells drilled in 1894, however, established production in Summerland, which was eventually extended offshore on piers. 1899 was the highpoint of production from Summerland field, with over 200,000 barrels produced.

The most prolific accumulation in the basin is the Ventura Avenue field, discovered in 1918. Peak production was 76,600 bopd in 1954. The billionth barrel was produced in 2009, and current production is still approximately 7500 bopd. It is estimated there are approximately 3.5 billion barrels of oil in place. Numerous other onshore and offshore fields were discovered in the 1920's and 1930's. Congress and the California State legislature passed laws and regulations during this time in an attempt to facilitate orderly development.

California oil was critical to the U.S., fueling the Pacific Fleet during World War II. After the war, renewed interest in the basin led to numerous discoveries as well as the development and application of new technologies to improve our understanding of the subsurface. For example, in the early 1950's Natland and Kuenen clearly demonstrated the deep water setting for many of the sandstones (turbidites) in Ventura Avenue field that previously had been interpreted as shallow water facies. In the 1960's, Friedman published a study of cores from Saticoy field that clearly linked the orientation and distribution of natural fractures to the occurrence of subsurface faults. Additionally, the acquisition and interpretation of seismic data began to play a major role in exploring the Santa Barbara Channel.

Drilling activities were limited, however, as politics between the state of California and the Federal Government delayed the permitting process. In 1953 the OCS (Outer Continental Shelf) Lands Act established federal authority of areas 3 miles beyond the shoreline and by the mid 1950's the state of California started leasing offshore blocks and allowed drilling from fixed platforms with subsea completions. The late 1950's to mid-1960's saw state leases being rapidly developed, and OCS areas being explored while the federal government and the state of California litigated jurisdictions for the Santa Barbara Channel. By the mid-to-late 1960's OCS sales were being conducted and discoveries were being made in Federal waters. However, in 1969, the drilling accident on Dos Cuadras Platform A attracted unprecedented attention to offshore oil drilling resulting in drilling moratoriums and environmental policies that limited drilling and production for 10 years. Through the 1970's, technological advances to drilling and facilities enabled companies to resume development within the Santa Barbara Channel by having offshore oil processing and allowing development of the Santa Ynez Unit (SYU) to move forward. In 1981 production of oil and gas began from Platform Hondo, 12 years after its discovery. Overall, the 1980's and early 1990's yielded a limited rejuvenation of activity in the Santa Barbara Channel including two OCS lease sales, seven field discoveries, and five fields being put on production. However, by the mid 1990's, political pressure was exerted and new activity began to slow. Decommissioning of fields and disassembly of platforms began. During this time, new technologies and advances in extended reach drilling brought some hope for projects that would access offshore reserves from onshore drilling sites, but none of these were able to get approval.

This interest in the offshore potential spurred a number of technical advances, particularly with regards to the Monterey Formation. One of the most influential workers in the late 1970's and 1980's was Caroline Isaacs. Her seminal studies of the Monterey along the Santa Barbara coastline integrated compositional and depositional models with silica diagenesis and significantly advanced our understanding of this unique formation. Key projects by other workers addressed chronostratigraphy, source rocks, tectonics, and fracturing – advancing our understanding of the hydrocarbon system and reservoirs.

The 2000's saw steady production and implementation of technology to extend the life of many of the platforms. ExxonMobil was able to develop the Sacate field using extended-reach drilling from Platform Heritage, approximately 4-5 miles to the south. Overall, however, exploration and new development became highly restricted, and many producing companies started to scale back investments and activity. Many of the major operators sold their interests to smaller companies.

In May 2015, the pipeline that transported oil from SYU, Platform Holly and Point Arguello (Santa Maria Basin) Platforms experienced a leak north of Refugio State Park. Production at all these fields was shut-in and operations suspended. In 2024, Sable Offshore entered into agreements to restart SYU by 2026, once the pipeline is deemed operable. There will undoubtedly be political opposition and regulatory constraints to the project.

The Ventura and Santa Barbara Basins have played a key role in the development of the oil industry in California. The hydrocarbon resources were important drivers of economic development. Many important technical innovations resulted from these endeavors, both in terms of drilling and development practices, as well as our understanding of the geology of these basins and beyond.