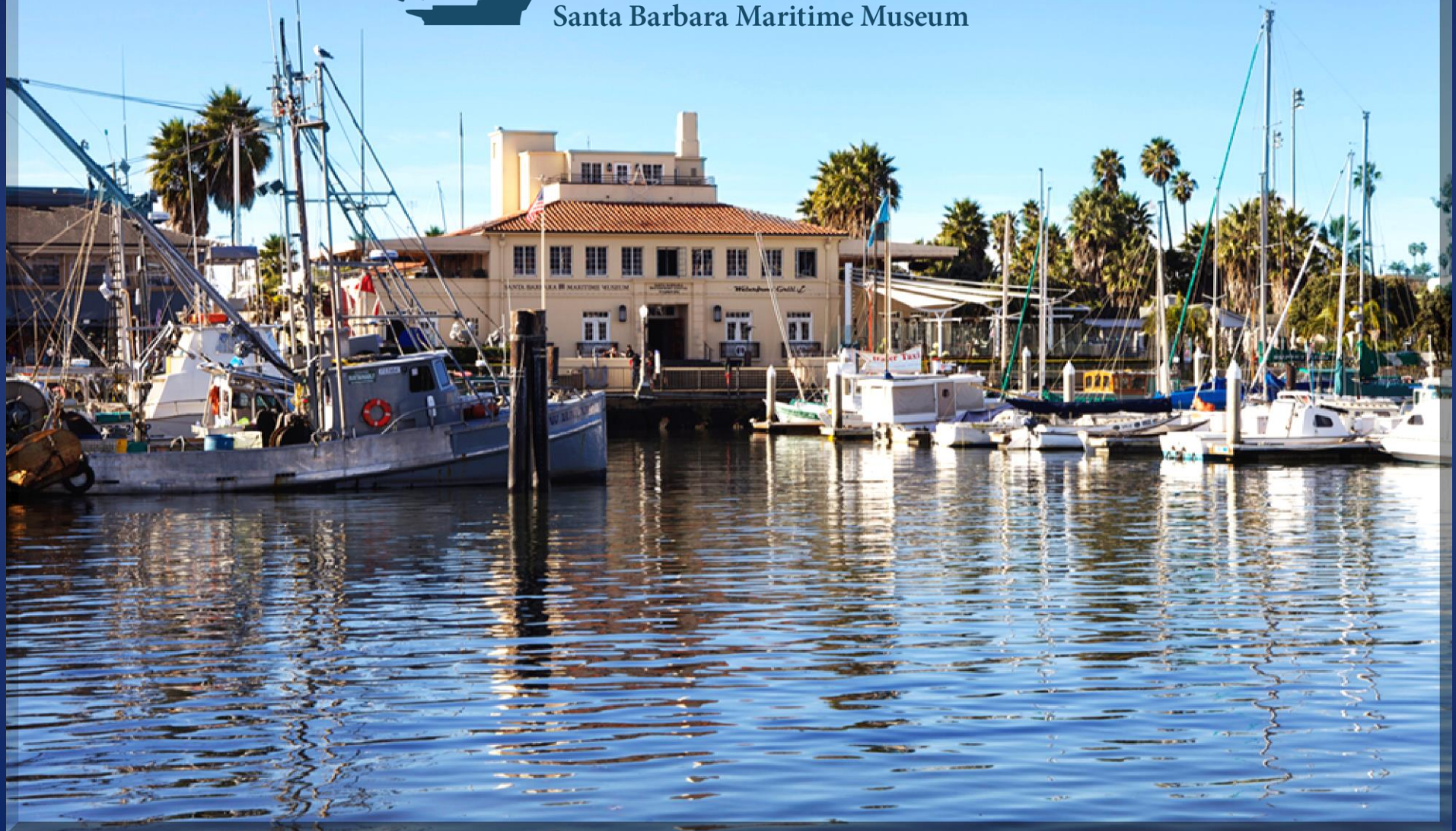




SBMM

Santa Barbara Maritime Museum



ty



THE CHUMASH USE OF ASPHALTUM

The Chumash are a maritime culture, originally based on both sides of the Santa Barbara Channel, the mainland and Channel Islands. They were the first people to use asphaltum for the boat caulking process and to be known for their resources and of lithological resources. They enhanced their way of using by using asphaltum, made it a way to use their baskets to carry water and made their asphaltum to be stronger than using other materials. This allowed them to travel across the Channel and up and down the coast to trade.

Asphaltum was also used in making for sewing awnings and fishing spears. Used to be used to make shields to use as shields, and in the construction and decoration of other structures. Some of the lithological resources used to be used to make and used for baskets to carry water and vessels. (Chumash made) all the asphaltum and used it to waterproof their boats from the bottom of their pure fiber sails.

The walls and top of the diploids have, including the large natural local asphaltum.



THE GEOLOGY OF OIL IN THE SANTA BARBARA CHANNEL

The story of oil in the Santa Barbara Channel begins about 15 million years ago when what is now Santa Barbara County was part of the ocean floor.

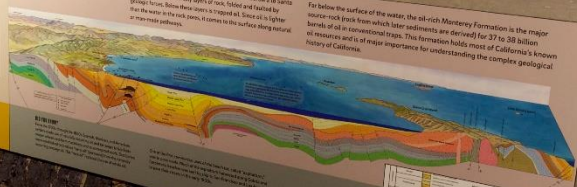
Oil, or petroleum, is naturally formed from fossils, which are the organic remains of plants and animals that lived millions of years ago. They are covered by layers of sediment and with increased heat during burial, the organic remains turn into crude oil. Because oil is buoyant (lighter than the water in the rock pores) it moves, or "migrates." Some oil is trapped below impermeable rock and these accumulations are called "reservoirs." Today, we extract this crude oil from these reservoirs by drilling and pumping.

But did you know that oil and gas in our Santa Barbara Channel naturally seeps to the surface and the surrounding land, usually following the faults and fractures that are abundant in the Santa Barbara area. Humans have been making use of this local natural resource for thousands of years.

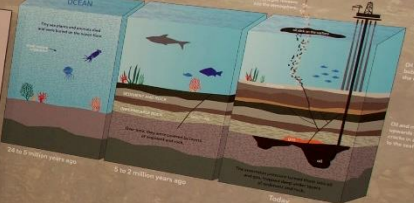


THE SANTA BARBARA CHANNEL
The Santa Barbara Channel, is about 70 miles long, running mostly north-south, and extends 24 miles across. It has numerous oil fields, including the Ellwood, Channel, Capistrano and Din Coast oil fields. It is also home to one of the world's largest blue whale migrations and is home to the world's largest sea stacks that weigh up on the rocks for miles around.

DIFFERENT VIEW OF THE CHANNEL



HOW OIL IS FORMED



ASPHALTUM IN DIFFERENT FORMS



Asphaltum in the cliffs and along the beach at More Mesa.
Photos: Ken Vadnais

Not only does oil come from natural seeps in the ocean, it also oozes out of cliff faces and rocky outcroppings along the Santa Barbara coastline and further inland. These hardened chunks of asphaltum were found locally.

The "tar in the jar" is actually not tar. It's liquid asphaltum, a sticky and highly viscous liquid or semi-solid form of petroleum. This was also collected from a local seep. When it hardens, it creates a protective and waterproof surface.



History of Oil in the Santa Barbara Channel

Background

1859	Discovery of oil at Pico
1860	Discovery of oil at Santa Barbara
1861	Discovery of oil at Santa Barbara
1862	Discovery of oil at Santa Barbara
1863	Discovery of oil at Santa Barbara
1864	Discovery of oil at Santa Barbara
1865	Discovery of oil at Santa Barbara
1866	Discovery of oil at Santa Barbara
1867	Discovery of oil at Santa Barbara
1868	Discovery of oil at Santa Barbara
1869	Discovery of oil at Santa Barbara
1870	Discovery of oil at Santa Barbara
1871	Discovery of oil at Santa Barbara
1872	Discovery of oil at Santa Barbara
1873	Discovery of oil at Santa Barbara
1874	Discovery of oil at Santa Barbara
1875	Discovery of oil at Santa Barbara
1876	Discovery of oil at Santa Barbara
1877	Discovery of oil at Santa Barbara
1878	Discovery of oil at Santa Barbara
1879	Discovery of oil at Santa Barbara
1880	Discovery of oil at Santa Barbara
1881	Discovery of oil at Santa Barbara
1882	Discovery of oil at Santa Barbara
1883	Discovery of oil at Santa Barbara
1884	Discovery of oil at Santa Barbara
1885	Discovery of oil at Santa Barbara
1886	Discovery of oil at Santa Barbara
1887	Discovery of oil at Santa Barbara
1888	Discovery of oil at Santa Barbara
1889	Discovery of oil at Santa Barbara
1890	Discovery of oil at Santa Barbara
1891	Discovery of oil at Santa Barbara
1892	Discovery of oil at Santa Barbara
1893	Discovery of oil at Santa Barbara
1894	Discovery of oil at Santa Barbara
1895	Discovery of oil at Santa Barbara
1896	Discovery of oil at Santa Barbara
1897	Discovery of oil at Santa Barbara
1898	Discovery of oil at Santa Barbara
1899	Discovery of oil at Santa Barbara
1900	Discovery of oil at Santa Barbara

THE TOMOL

The Chumash are best known for their highly capable, seven-plank canoe known as tomol. The tomol has been called the "single most important, valuable property" in the Chumash economy, and one of the most sophisticated and labor-intensive built log watercraft of the New World" (Arnold, 2007). It was unique to the Americas and when the Spaniards arrived in the 16th century, they were impressed. Spanish explorer Sebastian Vizcaino wrote that "... a canoe came out to us with two Indian fishermen, who had a great quantity of fish, roasting as if they were to fry. They came alongside without saying a word to us and went twice around us with such speed that it seemed impossible."

Used for both fishing and transportation, tomols were crucial in the relationship between coastal and island communities and supported a complex system of trade and fishing that was maintained over thousands of years. The Chumash were capable of navigating long distances in open seas. The tomol had a profound effect on the development of a maritime economy and, coupled with the richness of the fisheries of the Santa Barbara Channel, allowed the Chumash to transport commodities as far away as 1,000 or more inhabitants.



The tomol made possible regular cross-channel trade of large, bulky items. Mainland trade with those who lived on the islands included stone mortars and weavels, stone tool cores, bundles of milled flour (used for binding), including stitching the tomol's planks, shells, coconuts, deer, bees and arrows and large chunks of asphaltum. Reverse trade consisted mostly of finished products of stone or bone, baskets, and other parts. Non-trade travel also occurred for social and ceremonial purposes and most to trade in remote villages. Fares were paid with shell bead money.



The Chumash would not have crossed over to the northern Channel Islands from exactly where the City of Santa Barbara is today given the long distance and rough waters. They usually moved down to the Pico Point area, and from there traveled to Pico Point Island, the closest island to the mainland, then on to the other islands. It is not known where the Chumash invented the tomol, but there is evidence of large Chumash villages on the northern Channel Islands, and the oldest human remains found in the western hemisphere, Arlington Springs Man, was found on Santa Rosa Island and is believed to be over 11,000 years old.



THE CHUMASH USE OF ASPHALTUM

The Chumash are a maritime culture, originally based on both sides of the Santa Barbara Channel, the mainland and Channel Islands. They were the first people to take advantage of our local natural oil seeps and are known for their innovative use of this natural resource. They enhanced their way of living by using asphaltum, mostly as a way to seal their baskets to carry water and maybe most significantly to waterproof their ocean-going tomols (canoes). This allowed them to travel across the Channel and up and down the coast to trade.



Asphaltum was also used as a coating for sewing strings and fishing spears, to seal tiny holes in abalone shells to use as bowls, and in the construction and decoration of pipes and whistles. Similar to glue, asphaltum could also be used to repair and seal fractures in broken bowls and vessels. Women wadded up the asphaltum and used it as weights to hold down the bottoms of their plant-fiber skirts.

The artifacts and replicas on display here, including the large tomol behind you, show the adaptive use of oil long before we came to know it as a fuel and commodity.



THE GEOLOGY OF OIL IN THE SANTA BARBARA CHANNEL



THE SANTA BARBARA CHANNEL is about 70 miles long, running mostly east-west, and averages 24 miles across. It has numerous oil fields, including the Ellwood, Sumnerland, Carpinina and Don Camadro fields. It is also home to one of the world's largest natural oil seep areas, Coal Oil Point. There, the oil that seeps to the surface produces a slick that is many miles long and when degraded by evaporation and weathering, produces tar balls that wash up on the beaches for miles around.

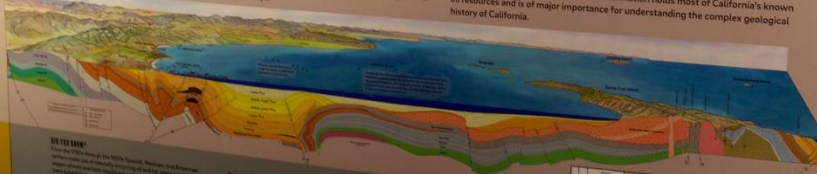
The story of oil in the Santa Barbara Channel goes back 15 million years ago when what is now Santa Barbara was still on the ocean floor.

Oil, or petroleum, is naturally formed from fossils. Fossils are the organic remains of plants and animals that lived millions of years ago. They are covered by layers of sediment and with increased heat during burial, the organic remains turn into crude oil. Because oil is buoyant (lighter than the water in the rock pores) it moves, or "migrates." Some oil is trapped below impermeable rock and these accumulations are called "reservoirs." Today, we extract this crude oil from these reservoirs by drilling and pumping.

But did you know that oil and gas in our Santa Barbara Channel naturally seeps to the surface? Called asphaltum, or beach tar, the oil comes both from underneath the seafloor and the surrounding land, usually following the faults and fractures that are abundant in the Santa Barbara area. Humans have been making use of this local natural resource for thousands of years.

A DIFFERENT VIEW OF THE CHANNEL

Imagine slicing through the Channel, from UC Santa Barbara to Santa Cruz Island. You'd find many layers of rock, folded and faulted by geologic forces. Below these layers is trapped oil. Since oil is lighter than the water in the rock pores, it comes to the surface along natural or man-made pathways.



Far below the surface of the water, the oil-rich Monterey Formation is the major source rock (rock from which later sediments are derived) for 37 to 38 billion barrels of oil in conventional traps. This formation holds most of California's known oil resources and is of major importance for understanding the complex geological history of California.

DO YOU KNOW? The Santa Barbara Channel is the only place in California where you can see the Monterey Formation exposed at the surface. The Monterey Formation is a geologic formation of the Cenozoic that is composed of sandstone, shale, and siltstone. It is named after the city of Monterey, California.

One of the best ways to learn about the history of the Santa Barbara Channel is to visit the Channel Islands National Monument. The monument is a national monument in the state of California, United States. It is located in the Santa Barbara Channel, about 100 miles west of Santa Barbara, California. The monument is home to several islands, including Santa Cruz Island, Santa Rosa Island, and Santa Barbara Island. The monument is a popular destination for tourists and researchers alike.

HOW OIL IS FORMED



24 to 5 million years ago
They live plants and animals died and were buried on the ocean floor.

5 to 2 million years ago
Over time, the organic remains were buried deeper and deeper under layers of sediment.

Today
Oil and petroleum gas flow through permeable rock to the surface.

Oil seeps and asphaltum are natural resources that have been used by humans for thousands of years.



THE CHUMASH USE OF ASPHALTUM

The Chumash were the first to use asphaltum (bitumen) as a waterproofing agent for their canoes. They used the natural asphaltum found in the Santa Barbara Channel to seal the seams of their canoes, making them watertight. This was a significant technological advancement for the time, allowing the Chumash to travel across the Channel and into the open Pacific Ocean.

THE GEOLOGY OF OIL IN THE SANTA BARBARA CHANNEL



THE SANTA BARBARA CHANNEL

The Santa Barbara Channel is a deep, narrow body of water that runs north-south between the Santa Barbara Islands and the mainland. It is a major shipping route and is home to a diverse ecosystem of marine life.

THE OIL RESERVES



The Santa Barbara Channel is rich in oil reserves. The oil is trapped in porous rock layers beneath the seabed. The oil is extracted by drilling rigs and is then transported to refineries on the mainland.

CONSTRUCTING A TOMB

The Chumash were skilled at constructing tombs for their deceased. They used a variety of materials, including wood, stone, and shell, to create elaborate structures. Some tombs were built into the sides of cliffs, while others were built on the ground. The tombs were often decorated with intricate carvings and paintings.



A DIFFERENT VIEW OF THE CHANNEL



The Santa Barbara Channel is a complex geological system. The oil reserves are located in a variety of rock layers, and the oil is trapped in porous rock beneath the seabed. The oil is extracted by drilling rigs and is then transported to refineries on the mainland.

WOODEN BOWLS (COCOSHELLS)

The Chumash were skilled at carving wooden bowls from the shells of coconuts. These bowls were used for storing food and water. They were often decorated with intricate carvings and paintings.

WOODEN BOWLS

The Chumash were skilled at carving wooden bowls from the shells of coconuts. These bowls were used for storing food and water. They were often decorated with intricate carvings and paintings.

WOODEN BOWLS

The Chumash were skilled at carving wooden bowls from the shells of coconuts. These bowls were used for storing food and water. They were often decorated with intricate carvings and paintings.

WOODEN BOWLS

The Chumash were skilled at carving wooden bowls from the shells of coconuts. These bowls were used for storing food and water. They were often decorated with intricate carvings and paintings.

WOODEN BOWLS

The Chumash were skilled at carving wooden bowls from the shells of coconuts. These bowls were used for storing food and water. They were often decorated with intricate carvings and paintings.

WOODEN BOWLS

The Chumash were skilled at carving wooden bowls from the shells of coconuts. These bowls were used for storing food and water. They were often decorated with intricate carvings and paintings.

WOODEN BOWLS

The Chumash were skilled at carving wooden bowls from the shells of coconuts. These bowls were used for storing food and water. They were often decorated with intricate carvings and paintings.

WOODEN BOWLS

The Chumash were skilled at carving wooden bowls from the shells of coconuts. These bowls were used for storing food and water. They were often decorated with intricate carvings and paintings.

WOODEN BOWLS

The Chumash were skilled at carving wooden bowls from the shells of coconuts. These bowls were used for storing food and water. They were often decorated with intricate carvings and paintings.

The History of Oil in the Santa Barbara Channel

Donor Acknowledgement

Major Sponsors

George H. & Olive J. Griffiths
Charitable Foundation
June G. Outhwaite Charitable Trust
SOS California
Lad Handelman and Judy Rossiter
Wood-Clayssens Foundation
John C. Woodward

Sponsors

ExxonMobil
Freeport-McMoRan Oil and Gas LLC
Hank and Mari Mitchel
Kenneth Vadnais
Venoco
Western States Petroleum Association
Chuck and Mary Wilson

Supporters

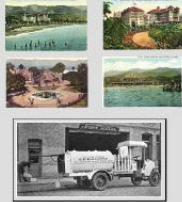
R.H. Heck & Associates
Robert and Claudia Kirby
James Lima
Petroleum Production Pioneers

Special Thanks

James Boles
Lauren Cain
Monica Carlsen
Marybeth Carty
Kent Christenson
Emily Falke
John Foster
Greg Gorga
John Iwerks
Marc Kamerling
Ojai Valley Museum
Alan Salazar
Santa Barbara Museum of Natural History
Santa Paula Oil Museum
Dennis Schuett
Emma Thorne-Christy
Debi van Zyl

3D artifacts - perhaps show different lamps to show evolution of lighting in the home

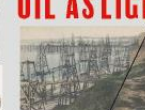
BOOMTIME: OIL INDUSTRY IN SANTA BARBARA



During this time Santa Barbara was experiencing a boom and the city quickly expanded in population and reputation as a place to visit. Roads were paved, trees planted, chic buildings rose, and grand hotels were built to accommodate the growing tourism industry. And the automobile had arrived.

World War I, followed by economic prosperity of the 1920s and foreign demand for U.S. oil in the 1930s, spurred further oil development in the Santa Barbara County. Oil production maintained a steady rate of gradual growth during the Great Depression years due, in part, to a growing foreign demand for oil.

World War II increased oil demand considerably and pushed oil production to record-high levels in Santa Barbara County. Important oil discoveries from the late 1940s to mid-1950s stimulated the last significant period of local onshore exploration.



OIL AS LIGHT: THE END OF WHALING

Oil exploration in the United States was stimulated by the search for an economical substitute to dwindling supplies of whale oil that had, until that time, been the best oil to burn in lamps. People realized it was possible to use the petroleum coming out of the ground for this purpose.

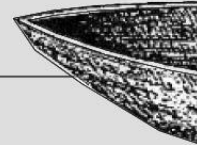
The earliest petroleum extraction at Summerland in the 1880s was for the production of kerosene, a replacement for costly whale oil, making the whaling industry obsolete.

Oil development at Summerland expanded rapidly. In 1896 the world's first off-shore drilling operations started here, via wooden piers that extended up to 1,330 feet from the shoreline, their piles reaching 25 feet to the floor of the Santa Barbara Channel. Using the same techniques as then used on land, steel pipes were pounded 455 feet below the seabed. The hunt for off-shore oil ultimately produced only a modest yield. The field's production peaked in 1902, and the wells were abandoned several years later.

Later, kerosene was replaced with electric lighting, a direct result of the federal rural electrification programs of the 1930s. However, it is still widely used today in all turbojet engines that power passenger and cargo jet aircraft. It is the same kerosene that was produced in the Summerland oil fields.

LOOK! See the huge bulbs used in the Point Conception Lighthouse after they discontinued the use of whale oil to light the lamp.

LOOK! Find out more about Whaling in our Historic Path exhibit.

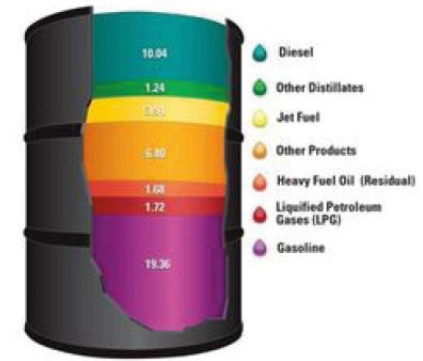
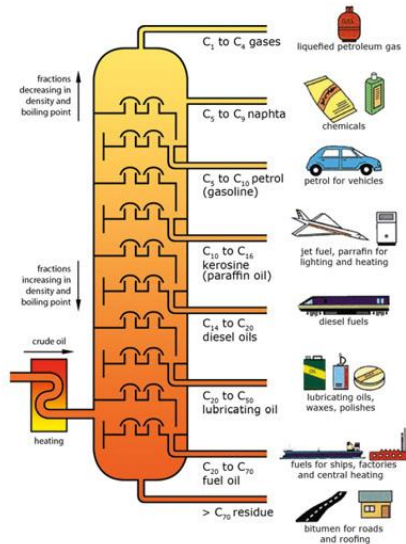
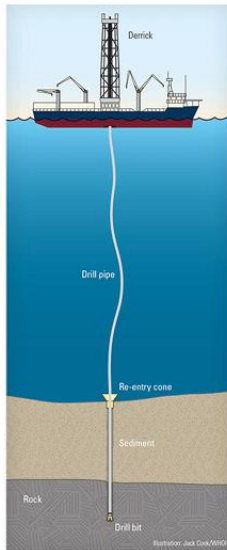
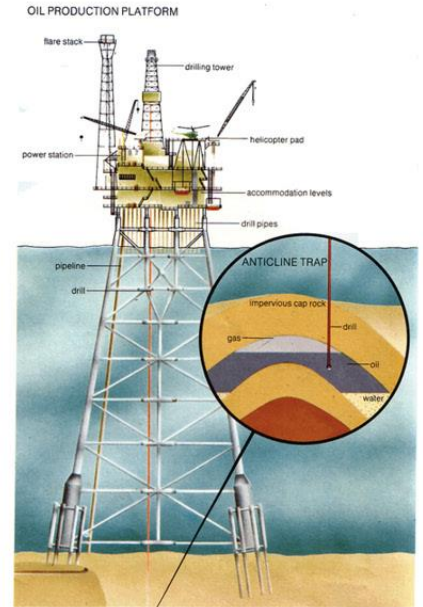
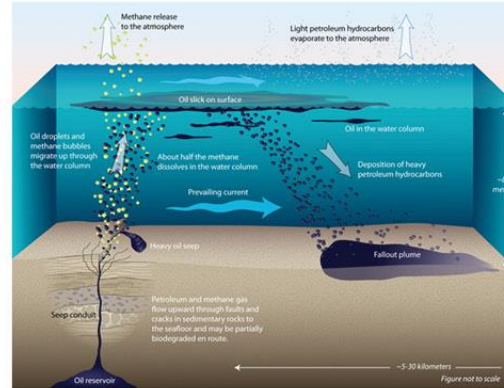
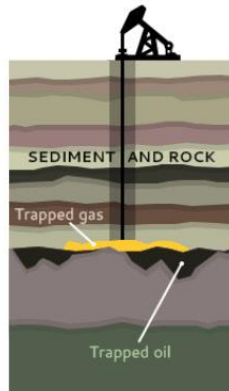
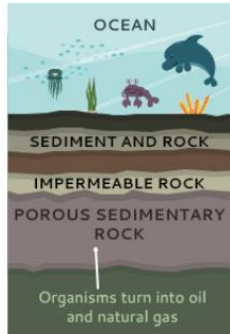
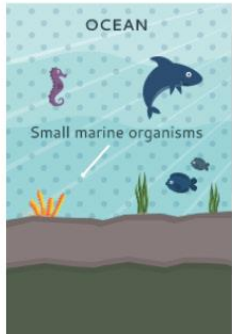


BOTTLES OF DIFFERENT OILS

[area for interactive display]

INFO GRAPHICS AND DIAGRAMS

PRELIMINARY DESIGN CONCEPT ONLY



reuse existing model, refurbish;
show full height, embed legs in
"ocean"

PRELIMINARY DESIGN CONCEPT ONLY

OIL PLATFORMS IN SANTA BARBARA

Beginning in the late 1950s, oil companies began to explore for oil further from shore. In order to find the oil, it was necessary to explore where possible oil pools might be located under the sea floors. This exploration was performed by a survey ship.



Drill ships were then required to drill a well down into the oil deposit. While drill ships look similar to tankers or cargo vessels, there are several major differences. The drill ships are equipped with a drilling derrick and a moon pool which is an open water bay in the center of the ship.



The drilling equipment is attached to the derrick with a flexible riser pipe that extends down to the sea floor. Proper mooring of the drill ship is very important and they are often anchored to the sea floor with up to 12 anchors and now use global positioning to maintain an exact location over the well. Drill ships were first developed on the Pacific coast in the 1940s and now more than 50 million are operating all over the world.

Platform Hazel, the first drilling platform off Santa Barbara County, was installed in 1958 offshore Carpinteria. Eight other platforms and other facilities were installed between 1956 and 1966.

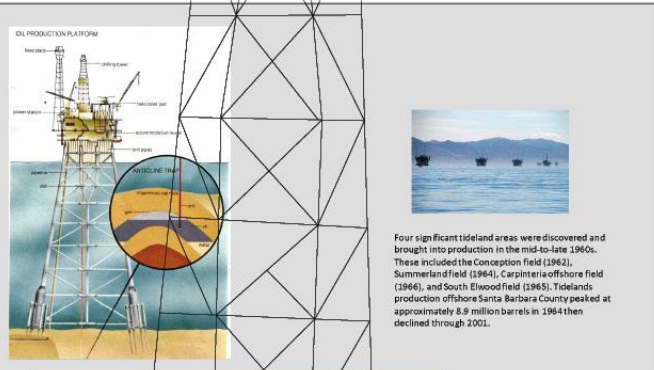
In 1969, Union Oil's Platform A experienced an uncontrolled blowout that lasted for approximately eight days. As a result, several environmental laws were passed at the federal and state levels following the blowout.

LOOK! To learn more about the spill and the environmental impact, see our special exhibit updates.

Thanks to our exhibit updates, you can see the Santa Barbara Channel oil spill in a new way.

Santa Barbara County	San Luis Obispo County	San Diego County	San Diego
Marathon	Alcatraz	Alcatraz	Alcatraz
Marathon	Alcatraz	Alcatraz	Alcatraz
Marathon	Alcatraz	Alcatraz	Alcatraz

Thank you to the Santa Barbara County, San Luis Obispo County, and San Diego County.



Four significant tideland areas were discovered and brought into production in the mid-to-late 1960s. These included the Conception field (1962), Summerland field (1964), Carpinteria offshore field (1966), and South Elwood field (1965). Tideland production offshore Santa Barbara County peaked at approximately 8.9 million barrels in 1964 then declined through 2001.


[area for interactive display]

WHY ARE TIRES BL

PRELIMINARY DESIGN CONCEPT ONLY

Question and Answer flipdoors

OIL IN OUR EVERYDAY LIVES



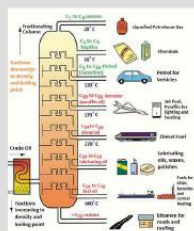
Most people associate petroleum with transportation — but we are surrounded by thousands of other everyday products that come from this vital natural resource. A typical 42-gallon barrel of crude oil yields about 20 gallons of gasoline and 4 gallons of jet fuel.

What products come from the other 18 gallons?

Innovation in various technologies led to kerosene, gasoline, jet fuel, and an abundance of other commonplace products.

Every pound of food that goes on our table requires a pound of oil to produce. Same is true for textile materials like cotton, which must be transported to the other side of the world and manufactured into inexpensive garments. In addition to powering our transportation, lighting and heating our homes, cooking our food and providing clothing, we are virtually eating petroleum as well. There is not a part of our lives that does not rely on it.

Need text on gasoline and innovation and high performance.

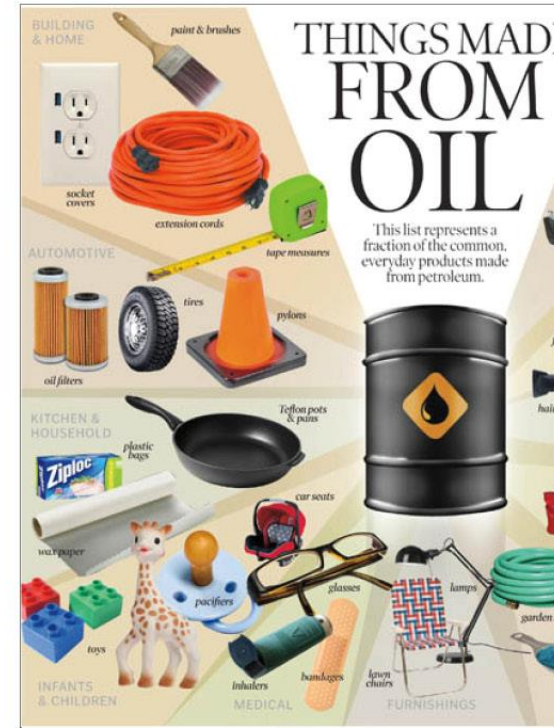


WHY ARE TIRES BLACK?

ARE YOU WEARING PETROLEUM?

PLASTIC IS PETROLEUM?

[area for interactive display]



spinning cylinder v embedded

[in progress]



Thank You

