

Mother Nature's Oil Wells

A parent/teacher guide to natural petroleum seeps

What is that black goopy stuff on the sand?

The black, thick deposits that we often see on the beach and floating on the ocean is a natural seepage from the ocean bottom called "tar." Tar, or "rock oil," is a type of petroleum, and is very abundant along the California coast. It has been around for thousands of years and has many uses. Hundreds of years ago, Native Americans used tar to seal their baskets, start fires and caulk their small boats. Years later, pioneers used tar to grease their wagon wheels. Today, we use tar for roofs, sidewalks and streets.

According to petroleum geologists, natural seeps can benefit the environment since oil is a natural organic substance and is food to some types of organisms.

Where does tar come from?

Tar is only found in certain types of rocks, like shale, sandstone and limestone. Most of these rocks are located on the bottom of the ocean. These rocks are called porous rocks because they have many small holes in them. Porous rocks will "seep out" petroleum when there is movement in the earth or shifting of ocean floor sediments. Since petroleum is lighter than water, it rises to the top of the ocean where currents, tides and wind carry it to shore. Geologists believe tar seeps have been leaking natural tar into the environment for thousands of years.

Some oil-bearing rocks can also be found on land. They will "bleed" tar as a result of temperature, erosion and shifting of the earth (such as an earthquake). One famous land tar seepage is the La Brea Tar Pits in Los Angeles, which was so large it trapped animals and people a long time ago. We do not have to worry about this happening to us today because we have drawn out so much petroleum from reservoirs to use in our homes and automobiles.

The History of Tar

It wasn't until the mid-nineteenth century that geologists began studying oil seeps and how they related to rock formation. They studied the history of the California coast and learned that the area was a lot more mountainous than it is today. Through research of rocks and fossils, geologists determined that tar was created millions of years ago from organic material consisting of small animals and plants that were washed to the ocean's floor by eroding rocks from the

mountains. The material was buried with mud and dirt, and mixed with other organic material from the ocean floor. Eventually material began to accumulate on top of other layers. Over a period of thousands of years, this material turned into petroleum rich rocks. And when the earth moves or heats up, this petroleum seeps out of the rocks and forms the tar that you sometimes find on the beach.

Natural Seepage on the Beach



Since petroleum is lighter than water, it rises to the top of the ocean where currents, tides and wind carry it to shore.

For further information about Mother Nature's Oil Wells or other refinery related information, contact the refinery's Policy, Government and Public Affairs office at 310.615.5254. Off-hour needs can be addressed by calling the 24-Hour Community Response Hotline at 310.615.5342.

Selected References

- Galloway, James M., Natural Oil and Gas Seepage in Coastal Areas of California
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- Landes, Kenneth K., 1973 Mother Nature as an Oil Polluter
- Brown, Joseph E., Mother Nature's Oil Wells