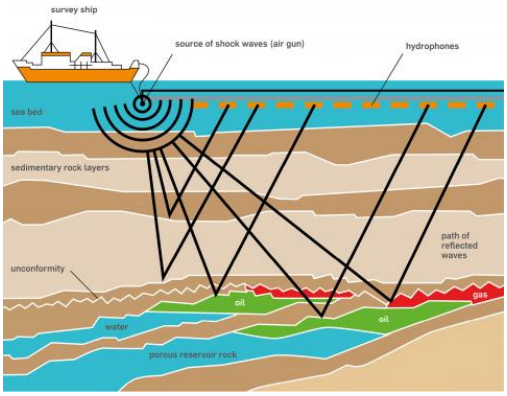
OIL - HOW IS IT FOUND?



To find oil underwater, researchers conduct seismic surveys to determine “what lies beneath.” This image, from KrisEnergy, Ltd., depicts how a two-dimensional seismic survey works. Soundings, which begin at the research ship, originate as shock waves set in motion by an air gun. Receivers, called hydrophones, can tell how quickly and how loudly those sound waves travel through the water. Experts use that data to determine whether oil could be located below the water’s surface.

When car makers began mass-producing automobiles, in the early 1900s, the need for oil dramatically increased. Finding oil, in those days, was even more difficult than it is now.

Without computers and sophisticated technology, oilmen used their intuition and searched for oil seeps and other surface signs that might hint of “black gold.” Mostly, as many would say, they “got lucky” whenever they found “a gusher” like Spindletop. When that Texas well shot oil 150 feet into the air, in January of 1901, people everywhere were stunned.

Finding oil today is more scientific and geologists play a leading role. But nothing is ever certain in the world of oil and gas exploration, and even computer models are not always accurate. One thing, however, is always true: It’s expensive to find, and extract, oil.

Is it possible to really know what’s below ground? How can anyone determine what is under the seabed if a drill first has to pass through 5,000 feet of water before it even reaches the first inch of drillable surface?

Seismic technology is one method companies use to determine the location of potential oil reservoirs. Here’s how it works:

> *Seismic technology uses the reflection of sound waves to identify subsurface formations. A crew working on the surface sets geophones at intervals along a straight line. Then a loud noise is created at the surface.*
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> *The noise moves throughout the ground and reflects off of underground formations. How quickly and loudly that sound is reflected to the geophones indicates what lies below ground. This process is repeated many times.*
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> *Different types of formations reflect sound differently, providing a picture of the types of rocks that lie below. If the geophones are laid out in straight lines, the results are called two-dimensional seismic. If they are in a grid pattern, the result is called three-dimensional seismic.*
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> *Reading 2D seismic images to find possible traps and reservoir rocks was as much art as science. Today, sophisticated technology and high-speed computers help geophysicists process massive amounts of seismic data.*
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> *From these data, they can develop 3D underground maps that significantly improve the industry’s ability to locate possible oil or gas deposits. But until a well is drilled, it is impossible to know for certain whether the resource is there, whether it is oil or gas, and whether it can be recovered in commercial quantities.* (Quoted passage from the *Society of Petroleum Engineers*, "How Is Petroleum Formed?")

Because a great deal of known oil reserves are underwater, offshore drilling has become a common method of finding and extracting petroleum. Approximately one-quarter of America’s natural gas, and one-eighth of its oil, is produced from petroleum located beneath the Gulf of Mexico.

Offshore oil rigs are used to find and remove those resources.

Of the 4,000 (or so) oil rigs at work in U.S. territorial waters (during 2010), most are in the Gulf of Mexico. Mineral Management Services - a federal-government agency (at work in 2010) - leases offshore lands and regulates activities performed by companies operating offshore rigs.

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Media Stream

Black Gold at Spindletop - Lucas Gusher
Image online, courtesy the Texas Energy Museum via the Beaumont Enterprise website.
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