

Career *currents*

Exploring Today's Energy Careers with the NEED Project

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Wheel and Deal in the Petroleum Industry as a Landman

Do you like to negotiate and make deals? Are competence and integrity two characteristics that define who you are? If you want a business or law degree, but have an interest in the petroleum industry, too, a career as a **Landman** may be the perfect choice for you.

Landmen run the business side of the oil and gas industry's mineral exploration and production activities. They work for major oil companies, large and small independent companies, and as self-employed landmen.

Company landmen negotiate property deals and trades with other companies. They draft contracts (and administer their compliance), acquire leases and ensure compliance with governmental regulations.

Independent field landmen serve clients on a contract basis and are generally the industry's contact with the public as they research courthouse records to determine property ownership and prepare necessary reports, locate mineral/land owners and negotiate oil and gas leases with them, and conduct surface inspections before drilling.

Independent land consultants serve clients on a contract basis and much effort is directed to due diligence examinations required in the purchase and sale of companies and properties.

Most landmen have business degrees. Some landmen continue their education and receive law degrees as well. Five U.S. universities offer accredited, specialized degree programs in petroleum and minerals land management: University of Oklahoma, University of Houston-Downtown, University of Louisiana at Lafayette, University of Mississippi and Texas Tech University.



Above, before an oil well begins extraction, a landman must negotiate a property lease.

Continuing education is an important part of a landman's career. The constantly evolving nature of the oil and gas industry requires a landman to stay on top of changes in government regulations and title laws, as well as technology changes in engineering and geoscience disciplines.

Robin Forte, executive vice-president of the American Association of Petroleum Landmen offers this advice to any young person considering a career as a landman, "Work hard. Do and learn everything you can. Always be preparing for your next job. Remember, in the land business, your reputation is all you will ever have—this includes competency and integrity."

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Career Currents provides educators and students with resources to introduce energy careers. Each issue focuses on a different sector of the energy industry. No single issue is meant to be all-inclusive to either the sector profiled or all careers in energy. This issue focuses on careers in the petroleum and natural gas industries.

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Sponsor Spotlight: Society of Petroleum Engineers

The Society of Petroleum Engineers (SPE), is a worldwide, individual-member organization serving professional managers, engineers and scientists in the energy resources development and production segments of the oil and gas industry. NEED and SPE work together to provide training and curriculum materials to teachers.

The Society of Petroleum Engineers' mission is:

To collect, disseminate, and exchange technical knowledge concerning the exploration, development and production of oil and gas resources, and related technologies for the public benefit; and to provide opportunities for professionals to enhance their technical and professional competence.

Major technical disciplines of the SPE include:

- Upstream oil and gas operations, including Drilling and Completions;
- Health, Safety, Security, and Social Responsibility;
- Management and Information;
- Production and Operations;
- Projects, Facilities and Construction; and
- Reservoir Description and Dynamics.

There are more than 73,000 members in the SPE, participating in 162 sections in 65 countries and 161 student chapters in 46 countries. SPE's membership represents 113 countries.

The petroleum industry offers a wide-range of career choices. The industry is driven by cutting-edge technology that makes it possible to recover oil and gas from areas several miles below the surface of our oceans and from remote locations far from existing roads, cities, or supplies. The technology and ingenuity that make this industry successful comes from many disciplines working together to produce the energy that powers our world. The Society of Petroleum Engineers has an educational web page where you can explore careers in the petroleum and natural gas industry by visiting www.energy4me.org/careers/careers.htm.

In addition, the SPE website, www.SPE.org, includes a section on Petroleum Engineering and Technology Schools. SPE's Education and Accreditation Committee annually compiles information on colleges and universities worldwide that offer courses of study in petroleum engineering and related disciplines. This resource has proven useful for industry, academic institutions, and prospective students of petroleum engineering and petroleum technology. Basic contact information for each school is listed, including the school's website. Additional information regarding the school's faculty, courses of study, program requirements, and number of graduates may be included.

The SPE website also provides information about many sources of scholarship funds for students interested in pursuing careers in the oil and gas industry.

To learn more about the Society of Petroleum Engineers, visit www.SPE.org.

Career Chat with a Marine Biologist

Meet Donna Schroeder, a **Marine Biologist** with the Minerals Management Service (MMS), U.S. Department of the Interior, in Camarillo, California. Donna earned an undergraduate degree from the University of Tampa and a graduate degree from the University of California, Santa Barbara.

Career Currents (CC): Hi, Donna. Tell us about your job.

Donna: I work with industry, academia, local government agencies and the public to understand and minimize the impact of the oil and gas industry on the environment. My specialty is in fish and fisheries issues.

CC: Why did you choose to work in this industry?

Donna: I chose to work in the oil and gas industry because I found it to be intellectually stimulating and because I enjoy the people with whom I work.

CC: What subjects or courses were instrumental in helping you gain your current position?

Donna: The ability to write well is valued in many professions, including science-related careers. If you can express a complex idea clearly to others, you will be very successful in life. Therefore, I would say writing classes were very useful to me.

CC: Would you follow the same career path again?

Donna: Absolutely, I would choose the same career path. I love my job!

CC: What opportunities have you had in your career?

Donna: I have traveled all over the world and been involved in some pretty exciting research projects.

CC: What challenges do you face in the industry?

Donna: I have experienced virtually no difficulties with industry in the U.S., but sometimes it is difficult to obtain information from overseas industries.

CC: What are some benefits to working in this industry?

Donna: There is a definite “can do” attitude in the oil and gas industry, which I find very beneficial since this allows a great deal of creativity to be expressed. Additionally, the earning potential is very good.

CC: What is a typical day of work like for you?

Donna: Every day is different! Some days I can be found out in the field diving using either scuba gear or a small submarine. Conducting field work is a regular job task for both environmental studies and inspections. Some days I

interact with staff from other agencies, members of industry, or academics, so I attend various meetings on a regular basis. Some of the most intellectually interesting aspects of my job are when I work as part of a team of **Analysts** (from both industry and government) that figure out how to get a job done with the least amount of environmental impact.

CC: What are the most rewarding, and most surprising, parts of your job?

Donna: The most rewarding part is completing a difficult task or project. The most surprising aspect is the variety of people I meet.

CC: How does your job interact with or affect the public?

Donna: I interact with the public quite a bit since many are interested in offshore oil and gas. Most of my job-related tasks are to listen to their concerns, and try to address them in any project I am working on.

CC: What do you expect to be doing in 5-10 years?

Donna: I expect to still be an analyst for the government, but will be working on different projects than the ones I am working on today.

CC: What is the most exciting technological tool you have used or helped develop?

Donna: This has to be a small research submarine (called a submersible) that we use to conduct surveys around the deep portions of offshore platforms.

CC: What advice can you give to a young person considering a career in the oil and gas industry?

Donna: I would advise students to try out a lot of different jobs or projects while they are young, and to view every experience, whether good or bad, as a learning opportunity. You never know what skills you might learn that will come in handy later on in life.

Below, Donna Schroeder enjoys diving in a submersible.



Career Chat

with a Production Planner

Our next chat is with Josh Etkind, a **Senior Production Planner** for Shell E&P Americas in New Orleans, Louisiana. Josh received his education in Petroleum Engineering from Texas Tech University in Lubbock, Texas.

Career Currents (CC): Hi, Josh. Tell us how you decided to work in the oil and gas industry.

Josh: I had the opportunity to visit a friend of my family's small oil and gas company in Denver when I was a senior in high school. I had no idea what I wanted to do with my life. I loved art, graphic art, music, business, computers, technology, communications—you name it! My experience there in Denver was so incredible and made such a deep impression on me. The work that was being done in the small oil and gas company was so dynamic, exciting, challenging and technically focused. It used computers, required creativity and out-of-the-box thinking, it required the ability to be a big picture thinker, yet be able to understand the details. It seemed to be the perfect thing to satisfy most of my interests all wrapped in one career.

The role of Petroleum Engineer seemed to be the one that would open the most doors and be the most exciting, plus the starting salary was higher than any other undergraduate degree in any discipline. Also, after applying to universities, I realized there are tons of scholarships available that will pay for most of the costs of the school. I figured that I would be taking mostly general courses the first two years anyway, might as well get my school for free and have a chance to see if this was the right path for me. When I did my first summer internship, it became clear that I had found the place for me. I've never turned back and I can't tell you how incredible the ride has been so far.

CC: What subjects, courses, internships, or special training were instrumental in helping you gain your current position?

Josh: The summer internships were key. In some cases, you can even get an internship the summer before you start school. These are high paying jobs and really fun, too. I highly recommend working every summer. The other thing that has made a huge difference in my career is active membership and volunteerism in the professional society for the industry, the Society of Petroleum Engineers (SPE).

CC: What do you think of the industry now that you work in it?

Josh: Look, this is the place to be. The innovations that will support the future growth and prosperity of mankind will come from the energy industry and the Petroleum Engineer is uniquely positioned to be at the forefront, and will get paid well for doing it.

CC: What opportunities have you had in your career?

Josh: I have many people to thank for being where I am today. What I learned is that if you respect all the people around you, from the janitor to the president, people will appreciate it and notice. Listen to their perspectives and learn from them. Many people have extended to me a warmth and caring that you would only expect from family, and they have given me opportunities to prove myself. Always keep your promises and never over-commit. Every time you deliver on a commitment, you will receive a greater level of responsibility and trust. You never know what that trust will parlay into next.

My experiences with the Society of Petroleum Engineers have been incredible. I joined when I became a student, and quickly took on a leadership role in the student chapter board. As soon as I graduated I took a leadership role in the local section. I was given the opportunity to globally lead the Young Professionals initiatives in the society. This led to my ideas, passion and energy being recognized. I've just finished attending my first SPE International Board of Directors meeting after recently being elected. I'm not sure, but I'm likely the youngest member, at age 31, of this elite board in the 50-year history of this great organization. I'm surrounded by the pillars of the industry, and they are kind enough to treat me as an equal. I can't tell you how incredible that feels.

CC: What challenges do you face in the industry?

Josh: We have a horrible public image. When the news has stories related to the oil industry they always show the same old video clip from 1978 of a bunch of dirty guys throwing a chain around the drill pipe or unscrewing the drill string. That's not what it's like anymore. There aren't even people on the drill floor of the new rigs these days; it's all robotics and remote control stuff.

There's so much more to the industry than drilling wells. Have you ever seen the movie *The Minority Report*? We have technology that similarly allows you to enter a virtual 3-D world underground. You can slice through the earth, grab and twist wells to plan the drilling path, walk through the layers underground; it's just incredible. If people could just see it for themselves, like I did in Denver, they would have a very different opinion of the industry.

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Plus, in my opinion, the development of industrial-scale renewable energy will come from the oil and gas companies. Few other companies have the research and development or spending power of these massive corporations. For example, Chevron has the most geothermal energy of any company. Shell Wind Power is in the top three globally. Shell has had a biofuels branch for 20 years and has places in the world where biofuels are the primary fuel of choice.

CC: What are some benefits to working in the oil and gas industry?

Josh: International travel and intercultural exposure, cutting edge technology development, and you get to play with cool toys. As I mentioned before the pay is pretty darn good, and it's good for those with a short attention span because every day is a new challenge.

CC: What is a typical day of work like for you?

Josh: They're all different, but I'll walk you through an example. I walk in the door and log into my computer and download a fresh report that shows me how the Shell operations in North and South America are performing. I look for things out of the ordinary and then start digging in to find out what is causing certain countries to be producing less or much more than expected. I find the field responsible for the change and do more research, sometimes calling them directly. I compile my findings into two slides that I take to the Vice President of Production of the Americas and his management team. I brief them on what is going on and what requires their attention or frame decisions that they must make to lead the organization. I also show my most recent forecast of how much oil and gas we are likely to produce over the next two weeks, 90 days and remainder of the year. This is naturally an uncertain business, so I develop an uncertainties analysis that shows the statistical probability range where we are most likely to achieve.

I might spend my afternoon speaking to our team of **Reservoir Engineers** and our **Finance team** to present my ideas on how we can reduce the amount of work they need to do to forecast our business by more than 50 percent. The next day I may be flying off to Bangkok for an SPE conference or training course in London. It's fun stuff.

CC: What is the most rewarding part of your job?

Josh: It's fun when people actually listen to your ideas and you can see that your efforts can make a real difference in the world.

CC: How does your job interact with or affect the public?

Josh: I speak to people all the time to try to help them understand that every action they take affects our need for energy and the global geopolitical balance. Whether you walk or take your car, or leave the lights on when you leave a room, every action and decision counts.

CC: What advice can you give to a young person considering a career in the oil and gas industry?

Josh: Come and check it out, you have nothing to lose.



Career Chat with a Geologist

Meet Sharon Woods, a **Senior Staff Geologist** at Devon Energy Corporation in Oklahoma City, Oklahoma. Sharon received her degrees from The University of Oklahoma; a BS in Geology (1997) and an MS in Geology (2000).

Career Currents (CC): Hi, Sharon. Tell us about your job.

Sharon: I develop prospects for oil and gas exploration/exploitation. Basically, that means I do a lot of mapping (structure maps and isopach maps) and lots of cross-sections with existing wireline logs in order to determine where to drill the next wells.

CC: How did you choose to work in the oil and gas industry?

Sharon: As a young child, I was fascinated with rocks. As I got older, I became more interested in the drilling rigs all over Oklahoma and thought I wanted to be a petroleum engineer. I actually started out in college on that path, but when I took my first geology course, I was back to the rocks.

CC: What subjects, courses, internships, or special training were instrumental in helping you gain your current position?

Sharon: At the time I came out of college, there were very few companies hiring new grads. I asked for an internship with one of the local companies in order to get some experience. They ended up offering me a job at the end of the internship. Lucky me!

CC: What do you think of the industry now that you work in it? Would you follow the same career path again?

Sharon: Now that I have been in the industry for almost seven years, I absolutely love it! I wouldn't change a thing and I would have no problem doing it all over again.

CC: What challenges do you face in the industry?

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Sharon: The oil and gas industry is still very much a “man’s world,” but you see more women these days than you used to. You have to be willing to take risks because of the up and down nature of the business. You have to be willing to move to other companies to gain experience.

CC: What are some benefits to working in this industry?

Sharon: The opportunity to work all over the world.

CC: What is a typical day of work like for you?

Sharon: Busy! I usually work over nine hours each day. I check on the progress of my wells first thing in the morning. I correlate the progress with offsetting wells and input the data into the mapping program. If there are problems, I have to meet with the engineers to correct them. I work on maps and cross-sections for wells coming up on the drilling schedule. I consult with the **Geophysicist(s)** assigned to the area of interest on potential locations. If we have partners in wells, then I have to consult with the partners on drilling progress. We have weekly team meetings to discuss current drilling and upcoming wells.

CC: What are the most rewarding, and most surprising, aspects of your job?

Sharon: The most rewarding for me is finding out that a well for which I picked the location hit the target and is producing very well. The most surprising is finding out that a well for which I picked the location is doing much better than expected. However, you don’t always hit the target and that is a little disappointing. But, you learn and you move on to the next well.

CC: How does your job interact with or affect the public?

Sharon: I don’t necessarily interact with the public. However, finding (or not finding) oil and gas affects everyone!

CC: What do you expect to be doing in 5-10 years?

Sharon: I have always wanted to work in the international arena. So, after gaining a few more years experience, I hope to get that opportunity.

CC: What is the most exciting technological tool you have used or helped develop?

Sharon: The industry is always coming up with new and exciting technology to increase the chances of finding oil/gas or increasing the rates of production. It is just fascinating to me how wireline tools have evolved over the years.

CC: What advice can you give to a young person considering a career in the oil and gas industry?



Above, Sharon Woods teaches about petroleum formation.

Sharon: I would highly encourage anyone that is slightly interested in the petroleum industry to give it a try. The work force is aging and within the next five to ten years a great majority of the experienced personnel will be retiring. This industry needs many more young people to learn the trade from the experienced hands in order to carry on the business. I still plan to be in the industry another 20+ years. Even though there is a big push to develop alternate fuel sources, this industry will be here a very long time.

Geology Vocabulary

structure map - a display of the elevation of a particular rock layer, generally beneath the surface.

isopach map - a contour that connects points of equal thickness, displaying the stratigraphic thickness of a rock unit as opposed to true vertical thickness.

wireline log - a continuous measurement of formation properties with electrically powered instruments to make decisions about drilling and production operations.

offsetting well - an existing wellbore close to a proposed well that provides information for planning the proposed well.

wireline tool - cabling technology used to lower equipment into a well for maintenance, modification, repair or completion of an oil or gas well.

Skilled Personnel Shortages Equal Career Opportunities Offshore

Are you looking for a career that lets you push the boundaries of technology and innovation on a daily basis? Do you want to continually develop your skills and have opportunities to advance your career? Is a good salary important to you?

As the scene opens, you find yourself floating on a vessel in the middle of the ocean, using a crane to place a 100-ton object two kilometers down on the sea floor, with pinpoint accuracy, of course. A remote operating vehicle observes the procedure and sends TV images through a two-kilometer cable back up to your vessel. You aren't starring in the next movie thriller, but you are working with electrical, electronic, hydraulic and mechanical devices that would excite any movie goer and would have been considered science fiction just a few years ago. This is the offshore oil and gas industry.

Hugh Williams, Chief Executive of the International Marine Contractors Association, says there is currently a worldwide shortage of qualified personnel in the marine contracting sector of the offshore oil and gas industry. This includes people who work in constructing and operating new vessels, floating drilling rigs, diving platforms and support vessels, and remotely operated vehicles (ROVs). The offshore oil and gas industry is facing a boom time: it needs to build new vessels and staff them as fast as possible to keep up with demand.

Below, an offshore oil platform. Photo credit: DOE.



The high demand for skilled workers comes at a difficult time for several reasons. Worldwide, there has been a move away from working in industry in favor of working in the service sector. Professional engineers and skilled workers are being drawn to work in other areas. In addition, it is expected that in the next five to ten years, a large number of people will retire or leave the workforce, leaving a huge shortage of qualified employees.

According to Williams, "The industry is extremely busy and expected to remain so for a number of years. Many companies are experiencing significant challenges in recruiting a sufficient number of trained and skilled personnel for their projects all over the world. This is placing significant pressure on their desired growth and ability to deliver services."

Williams predicts that in the next two to three years, the industry will need to hire and train about 2,000 people to work on new vessels and drilling rigs as **Watchkeepers** across the bridges, decks and engine rooms; 800 additional personnel in **Saturation Diving** positions; 1,000 additional **Survey and Inspection Personnel**; and 1,200 **ROV Operators**. In addition, large numbers of **Air Diving Personnel**; deck, catering and ancillary crew; onshore and engineering support personnel will be required to operate the fifty new vessels under construction. While the number of new personnel needed in the industry may not seem that large, it will be quite a challenge. For example, worldwide, diving schools only train about 100 new saturation divers a year! "Indeed, the future health and growth of a number of industries, not just the oil and gas industry, may be directly affected by a shortage of trained personnel in the coming years," says Williams.

What is Saturation Diving?

Scientific divers are limited by diving depth, gas mixtures and supply, weather and decompression obligations. Saturation diving, a technique developed by the U.S. Navy in the 1950s, allows scientists to stay underwater for days or weeks at a time. Undersea laboratories, or habitats, provide a dry living space on the ocean floor for small teams of divers, known as **Aquanauts**. These scientists conduct research dives in the ocean near the habitat during the day, and, instead of coming to the surface after diving, return to the undersea laboratory to eat, rest and sleep.

Below, a saturation diver at work. Photo credit: NOAA.



International Energy Launches “Algae to Oil” Initiatives

Unlike food crops or cellulosic materials, algae produce oil naturally and can be processed to make biofuel, the renewable equivalent of petroleum, and refined to make gasoline, diesel and jet fuel.

According to a November 5, 2007 press release by International Energy, Inc. of Vancouver, British Columbia, International Energy is developing advanced biotechnology protocols for enhanced growth and biofuel productivity based entirely on the photosynthesis of algae, which have the unique capability of taking a waste (zero-energy) form of carbon and converting it into a high-density liquid form of energy (natural oil). As a result, algae have emerged as one of the most promising sources for biofuel production.



Certain algae produce and accumulate oil naturally and can, in the process, clean up waste by absorbing and utilizing nitrogen oxides and carbon dioxide, aiding in carbon sequestration and the mitigation of climate change. Hydrocarbons produced from the photosynthesis of unicellular algae offer advantages in the production, storage, and utilization of renewable biofuels, as they can be harvested easily, stored in liquid form and do not require special containment systems. Additionally, the process of industrial scale algae growth in photo-bioreactors is non-toxic, non-polluting, can be scaled up and offers a renewable energy supply.

“With the capacity to produce oil naturally and needing little more than sunlight and carbon dioxide to flourish, algae may well be the antidote to depleting fossil oil reserves and growing concerns about increased levels of atmospheric carbon dioxide,” states Mr. Harmel S. Rayat, a director of International Energy.

For more information, visit: www.internationalenergyinc.com.

Above, Algae slush. Photo credit: algaefuels.org.

