From Undergrad to Oil and Gas

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What Does the Industry Need?

- Young scientists to train before vast amounts of knowledge (people your parents age) retire over the next 5-15 years.
- People that can create/organize multiple data sets and clearly/concisely present a reasonable scientific interpretation with which a non-scientist can make significant economic decisions.
- General geologists - Petroleum geology is inherently interdisciplinary, the best oil/gas geologists are well versed in stratigraphy, sedimentology/geomorphology, paleontology, petrology, structure, hydrology, and chemistry, math, and economics never hurt!
- Petrophysicists - this is the intersection of geology and engineering, and its taught maybe at 2-3 schools in the country but is usually taught by a mentor once hired. Math, chemistry, and computer science are useful skills to have if its something you want to get into – they are in very high demand.
- Petroleum engineers – Most young engineers with this specialty don't make it through grad school because they are offered jobs regardless of whether or not they finish. A engineer even with a minor in geology is incredibly valuable, as engineer-geologist communication is notoriously bad.

Bachelor's Level

- Some oppertunities exist for BS-Level Graduates in Geology
- Better chances at smaller companies (10-500 employees) especially if you have a personal connection
- Most with a BS do "Geotech" work – usually loading and organizing geologic, land, and engineering data into mapping software/databases (ArcGIS, Petra, Geographix). Its uncommon that you will do much interpretation of geologic data, depending on who your mentor is and the needs of the company.
- Moving up from a "Geotech" position typically occurs when one completes a MS or has been around long enough to have acquired the experience/knowledge needed to collect and interpret data
- Some non-geology groups in the company may also be interested in you (Land/Leasing Department)
- There is not much recruitment at this level, you will likely have to pursue it on your own through any personal contacts or career fairs at conferences (AAPG, NAPE)

Graduate School

- Find an advisor whose research interests you, email them and find out if they have room/funding in projects you could get excited about. Don't worry too much about the exact nature of the project – you will figure that out once you start and often it takes some time to get to know the topic, relevant questions, and research direction before you get really excited.
- A boring project with a good advisor is rare and tolerable, a great project with a bad advisor is difficult but doable, a poorly defined project with a bad advisor is frustrating and (arguably) a waste of time.
- Companies typically recruit from large state universities along the Gulf Coast and throughout the west (think Louisiana, Texas, Oklahoma, Kansas, Colorado, Wyoming, Montana) as this is the source of many of their alumni and the locus of many research funds.
- Many of the "oiliest" schools have industry-sponsored research consortia which supply adequate funding and often, nice datasets: (University of Miami (in Florida), LSU, University of Houston, University of Texas at Austin, University of Oklahoma, University of Kansas, Colorado School of Mines, etc).
- Many of these consortia also serve as a recruitment tool for companies.

Jobs – Masters Level

What do you actually do?

- A Masters is considered the "working degree" in the industry
- Development – "watching" a drilling rig that's part of a development program (steering/guiding a horizontal wellbore), working with petroleum engineers to efficiently develop a known accumulation. (There is a lot of learning to be done here, much of which isn't taught in school)
- Reserves – using all of the available geologic and engineering data to determine the volume of oil/gas originally present in a known accumulation and more importantly, how much remaining is economically recoverable (this determines the value of your acreage)
- Exploration – using all of the available geologic and engineering data to find new accumulations of oil, gas, CO2, water, etc… This requires broad knowledge of many geologic disciplines (stratigraphy, structure, sedimentology, etc…) as well as regional knowledge of the basin(s) and their exploration/development histories. In bigger companies this is a team effort which you may be able to jump into early in your career, smaller companies usually trust their most experienced geologists with this task (which means it taken initiative, patience, mentorship, and/or a very small company to move into it quickly)

Jobs – Masters Level

- The biggest companies (Exxon, Chevron, BP, Shell, Statoil) have extensive training programs (2-5 years) which typically rotate you through different geological disciplines. They pay well but chances are you'll start in Houston and will often do an internship before a full hire. They'll teach you what (they think) you need to know and as such personality plays a bigger role in hiring than you might expect, especially relative to the topic of your MS thesis.
- The opportunity for international travel comes after training (a few years in)
- Advantages: Continuing education, good pay, potential for international work, lots of data.

- Big but not huge companies (Occidental, Anadarko, Noble, Encana, Conoco, Apache, Marathon, etc) are basically the same as the supermajors but have less of a global network of projects (less chance for international work, more US onshore).
- Low risk (probably not going to go out of business or be aquired)

Jobs – Masters Level Cont'd

- Medium to small companies (Newfield, Whiting, Cimarex, Concho, etc…) may or may not have a recruiting program and rarely have an organized training program for new hires (training on an as-needed basis).
- Personal connections become more important, as well as your existing skill set (because they may need it immediately)
- As in Grad School, having a good mentor that you like is ideal
- It can be easier to see the big picture of how the company works when its smaller, but budgeting can influence the amount of data you get to work with (and hiring)
- Most of these are onshore-focused, US and Canadian companies which may or may not have headquarters in Houston, less commonly Midland, TX; Dallas, TX; Oklahoma City, OK; Tulsa, OK; Denver, CO; Calgary, AB.

- Compensation/benefits are a bit more variable, smaller companies are higher risk (higher chance of running out of money) but can also be higher reward in certain buyout situations

Jobs – Ph D

While a PhD is rarely required for jobs in oil and gas, there are some advantages if you have one.

- Many of the highest level geologists (CEO's, VP's, Chief Geologists…) have their PhD's, and ended up at the top in part because they started with a broad knowledge of geology and had the work ethic to finish one/two multi-year research projects in grad school.
- Many of the consultants in the industry have their PhD's, often their consulting specialty is directly related to the geologic skills developed in their PhD (do not underestimate the power of having it on one's resume, rather than having to document your experience/growth post-Masters)
- The biggest companies often have research groups dedicated to developing new exploration and reservoir characterization concepts as well as being technical advisors to the regional groups. Its rare to be hired for this type of work without a PhD.
- You can go into academia too!

Now What?

If you're interested in Petroleum Geology or even just the pay check, become a member of AAPG and go to some conferences!

Let yourself dive into a geological subject, usually people get excited once they find out enough about a topic that they feel like they're good at it.

Think about grad school, remember that the name of the institution matters far less than the advisor, the availability of funding, and the connections you make there. Chances are that you'll be working hard and traveling on field trips often so the location isn't really a big deal either.

Read about the energy industry and new plays (Marcellus, Eagleford, Bakken, Utica, Niobrara). There are a lot of big numbers involved, but remember that they're all coming from wells, cores, seismic, and outcrops that geologists thought to study.