Poster 114-2

# Measuring the Match of Graduating Skills Portfolio to the Demand by Geoscience Employers

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## Abstract

With the economic malaise in the United States, colleges and universities are assessing the impact of academic programs related to their overall mission and constituency. Geoscience departments are facing pressure to demonstrate the return on investment of their educational program provides. The metrics of these inquiries are variable, but usually center on the employment of graduates; often from partial data gathered by alumni offices. Many departments do not have structured longitudinal tracking of their graduates, thus limiting the extent of their supporting information.

Current data on student-to-worker transition is at best uneven and limited in scope. AGI is leading a collaborative effort with a number of geoscience departments and several societies to establish a National Geoscience Exit Survey to build on prior AGI/AGU Master's and Doctorate Recipients surveys. The National Geoscience Exit Survey is being piloted across 32 colleges and universities with the intent to engage all 2- and 4- year geoscience programs in the US by the end of the 2011-2012 academic year. A long-term goal of the exit survey is to establish a longitudinal survey to follow graduates' career trajectories. The longitudinal survey will enable bulk analysis as well as department-level intelligence pertaining to geosciences graduate career trajectories that should be more complete than from the alumni office.

Further complicating the picture is that though the United States faces a severe shortage of geoscientists over the next 10 years, like most STEM disciplines, the skill portfolio and interests of new graduates is misaligned with the broader economy's needs. We will examine four different components: demand for new graduates, the employers' desired skill portfolio, the content background of new graduates, and the vectors of students at each degree level. With the current rate of new geoscience graduate production, the United States will be short nearly 150,000 geoscientists by 2021. However, most new geosciences degree recipients pursue careers other than in the geosciences, thus further exacerbating this gap.

## The Issue

Geoscience employers complain they have trouble finding suitable new graduates. New graduates complain there are few jobs available to them. Yet by all measures, there are a plethora of opportunities for new graduates, but are they the right fit for the geoscience workforce of today?

## The State of Knowledge

AGI is able to piece together data from disparate data sources and direct reporting from companies and students. Yet comparability of data and the potential for a gap between the reported metrics and those in practice remain challenges. AGI reports on trends that it knows validate across multiple sources, but to get the true case, we need direct knowledge on the skills of graduates vs. the practiced demand of employers.

## Some critical definitions

### Skills Portfolio

*A graduate's attractiveness is the range and depth of knowledge - a portfolio of capabilities that will grow and evolve during a career*

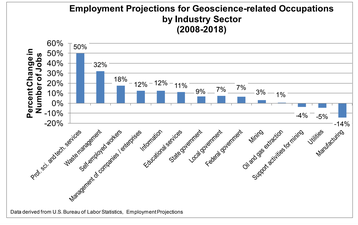
### What defines a "Career" in the geosciences?

*A job isn't a career. For most workforce studies, what you are doing 5 years after your highest degree marks your initial career.*

# The Four Factors of the Student - Professional Transition for Employment

## Demand for New Graduates

Where are the new jobs going to be in the future? The best source is the US Bureau of Labor Statistics. But will the model match reality?




## Employer's Target Skill Portfolio

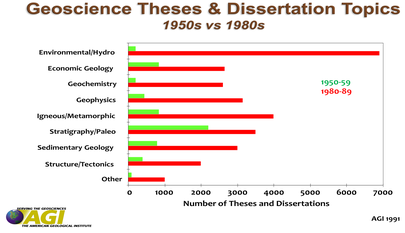
Beyond the 1999 skills survey, employers continue to report to AGI what they want for skills in their new hires beyond the fundamentals of geoscience and solid problem solving skils:
Field Experience (Mining 150 hrs, Env. 90 hrs)
Advanced Mathematics (DiffEq, Linear Algebra, etc.)
Demonstrable Communications Skills

But today, many hire environmental science graduates in lieu of the geoscientists they can't find, but they also do not expect the environmental science new hires to rise in their companies as they lack these fundamental skills they are looking for in geoscientists.

But what do these companies actually hire? What is the skills portfolio of those they keep past the first couple year?

## Content background of current graduates

What do current geoscience graduates know? The best that can be currently produced are proxies based on data such as the topic of graduate thesis and dissertations (below). But what about the other keys to employment - mathematics, communications, field experience? The best data we have is from the 1999 AGI/AAPG Skills Demand Survey. We need better and consistent data.




## Vectors of Grads at Each Level

Various surveys by AGI and other geoscience organizations consistently show:

28% of B.S. Grads go to Grad School
<20% get geoscience jobs at graduation
50% of M.S. Graduates work in the geosciences

But if they aren't going into "traditional" geoscience, where are they going? And are they utilizing their geoscience background? Are other fields attracting students with specific skill portfolios - and of those are they competing with our traditional employers?

**Critical to answer these questions with certainty is the National Geoscience Exit Survey and related Longitudinal Survey**