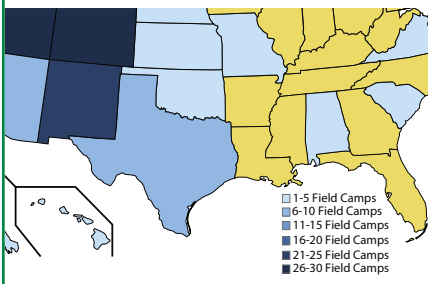
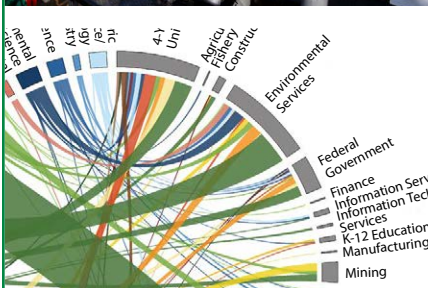


Status of the Geoscience Workforce



2016 Report

The biennial *Status of the Geoscience Workforce* report is the comprehensive benchmark of education, labor, and economic metrics for the geoscience profession.



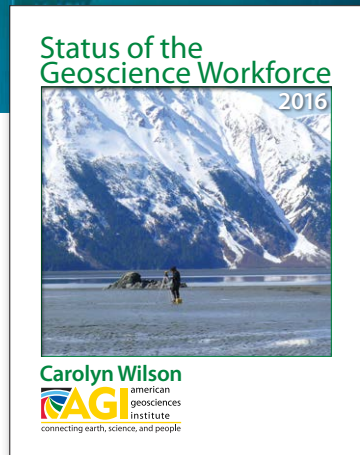
Even though the headlines in 2016 have been highlighting layoffs in the energy industry, all indicators show that demand for geoscientists remains robust with tight labor markets, constrained supply lines and increasing demand for high-skill talent. Environmental and engineering firms have seen continued expansion of demand for geoscience talent. This expansion is coupled with a recovery in the minerals sector and evidence that early-career hires in the energy sector have continued even as layoffs of experienced professionals continue.

The continued robust demand for talent is complicated by both continued rapid retirement of the Baby Boom generation and a rising concern about the quality of graduates entering the workforce. Most geoscience graduates lack quantitative skills beyond Calculus II, have not participated in professional development activities, such as internships, before graduation, and can have limited field work experience. About a quarter of graduates have advanced math skills, such as differential equations or linear algebra, and less than half have attended a comprehensive field camp experience.

Due to record enrollments, addressing these challenges has become increasingly difficult. Almost all graduate programs are at capacity and undergraduate programs are expressing concerns that large enrollments are resulting in students not being able to take advantage of certain opportunities, such as field camps.

One side effect of the record enrollments in geoscience graduate program is that not all students are able to gain admission to this critical step in a geoscientist's career development. Market forces have not accommodated this extra demand at the graduate level. However, our first evidence of capacity expansion at the undergraduate level is now evident in the development of online-only geology undergraduate programs.

Another major development is the shift in the future talent pool with increasing numbers of students starting their postsecondary education at the two-year college level. This shift, driven both by demographics and economic factors,



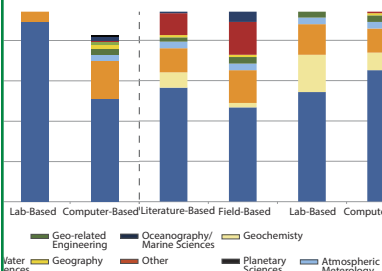
Status of the Geoscience Workforce 2016 Report

is apparent in the bachelor recipient data, and will likely impact the engagement of underrepresented populations in the geosciences given their disproportionate representation on two-year college campuses. This new dynamic will also allow geoscience programs at four-year universities to shift resources from recruitment of geoscience majors to further investments in high quality workforce skills and career development.



MAJOR FINDINGS FROM THE STATUS OF THE GEOSCIENCE WORKFORCE 2016 REPORT INCLUDE:

- Sixteen percent of doctoral graduates, 23% of master's graduates, and 33% of bachelor's graduates, began their postsecondary education at two-year colleges before transferring to a four-year university.
- Specific employer-sought skills remain scarce, with only 22% of undergraduates taking advanced math, such as differential equations or linear algebra, and only 40% of bachelor recipients having completed a comprehensive field experience/camp.
- Geoscience graduate programs remain at maximum enrollments, dramatically increasing competitiveness for entry into those programs. Undergraduate enrollments continue towards historic highs, especially with the emergence of web-based geology programs.
- Approximately 325,000 geoscientists were working in the United States in 2014. Even with the slowdown in the energy industry, overall hiring of geoscientists, especially in the environmental and engineering fields, has remained robust.
- While 48% of the geoscience workforce will retire over the next decade, the 2024 predicted shortage of geoscientists in the United States has dropped from 135,000 to 90,000 full-time equivalents as a result of a surge in new graduates and ongoing increases in worker productivity.



The report is based on original data collected by the American Geosciences Institute and existing data from federal sources, industry sources, and professional membership organizations. The 2016 edition of this report represents a synthesis of all the recent, readily available, and reliable data related to the geosciences. This includes the education and training of new geoscientists, the employment trends in the geoscience workforce, the federal funding trends for the geosciences, and the economic trends of the major geoscience industries. This report is broken down into 5 chapters:

Chapter 1: Trends in K-12 Geoscience Education — Preparing Students for College Geoscience Programs and Society

Chapter 2: Trends in Two-Year College Geoscience Programs

Chapter 3: Trends in Geoscience Education at Four-Year Institutions

Chapter 4: Geoscience Employment Sectors — Trends in Student Transitions and Workforce Dynamics

Chapter 5: Economic Metrics and Drivers of the Geoscience Workforce

To learn more about these findings and discover other trends related to the education, training, and demographics of the geoscience workforce, please visit <http://www.americangeosciences.org/workforce/reports> to purchase the report.

