EGU2012-9225 Four Cornerstones for Ensuring a Sustainable Workforce and Opportunity for the Next Generation of Geoscientists



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Abstract

The great demographic shift underway in many developed nations is impacting the geosciences extraordinarily hard.We examine the situation in the United States as an example of how there are four clear overarching issues to establishing a sustainable geosciences workforce: Carrying Capacity of the Educational Sector, the fundamentals of meeting future demand, the issue of graduate quality, and the emerging challenge of sustaining the capacity building of future geoscientist generations. The United States currently hosts about half of all geoscientists globally and is facing the imminent, and in the case of the Federal geosciences workforce, attrition of the Baby Boom generation geoscientists. This demographic shift is impacting all parts of the geosciences and when coupled by internal shifts in the geosciences on subdisciplinary thrusts, the match between the skill portfolio of new graduates is not necessarily wellaligned with the exiting skills of retirees. In particular, the US geosciences face the challenge of, based on current demand, attrition, and graduation rates of being short nearly 150,000 geoscientists by 2021. At the same time, the educational community is seeing the retirement of faculty that are leading into constrained ability to educate students in a number of topics, especially those in the resource industries. Given current funding trends and priorities, this phenomenon is likely to be in a feedback loop and will complicate the broad skill portfolio of the future geosciences. We also examine the issues of global migration and how it does not appear to be nearly as important to addressing the challenges as assumed by many. In addition, the prospective future geosciences majors appear to be of lesser quality than even 5 years ago based on test score, yet we will also present several broad strategies and cautionary tales that can help the US, and likely the global, geosciences community to ensure a stable and effective future and how this is actually opening new opportunities for the next generation of geoscientists.

Thoughts on the Future

The future of the global geoscience workforce is very similar to that of the United States. There are several critical issues that need to be recognized, and if appropriately embraced, will lead to a vibrant and sustainable geoscience profession for generations to come:

Continued Full Coverage of all Geoscience Areas in University Education

Recognition that Geoscience professionals can be substituted, but also recognize that we can convert those professionals into geoscientists

Embrace the communities that are intellectually capable and motivated to pursue higher education, but face other barriers.

Recognized the effective GDP in the developed world is stagnent, and that growth will be global and opportunities require mobility

The most critical additional skill is entrepreneurship - whoever makes geoscientsts substantially more efficient will reap huge rewards.

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Master's





Source: AGI Geoscience Workforce Program, data derived from the College Board College - Bound Seniors, Total Group Report 1996-2009

Departments granting over 25% of all degrees Departments granting the second quartile of all degrees Departments granting the second half of all degrees

Meeting Future Demand

The only metric of our success in building a sustainable profession is whether we are able to meet future demands for geoscience talent. Demand is a complex concept that the common metric - FTE's (full-time equivalents) varies over time with efficiencies, even if the sum of required work remains constant.

The Challenge in the U.S. between today and 2021

- 125,000 geoscientists expected to retire
- 72,000 geoscience job growth by 2018 (BLS)
- •15,0 total new graduates over the next 10 years
- total new graduates if you hire B.S. • Or 45 level
- Net deficit of over 150,000 by 2021

Capacity Building

Do we have the right people, knowledge, and skills getting their Ph.D.'s to properly educate the diverse needs of the next generation of geoscientists?





Core Challenges

- Decrease student attrition Geoscience major to career is 13% (half of other STEM fields)
- Import talent This isn't Information Technology..
- Expand domestic capacity
- Funding sources
- Quality of input

U.S. Theses and Dissertations by Topic Environmental/Hydr **Economic Geology** Geochemist Geophysic Igneous/Metamorpl Stratigraphy/Paleo Sedimentary Geology Structure/Tectonics Othe Source: GeoRef

What we are producing....