Geophysical Research Abstracts
Vol. 14, EGU2012-9225, 2012
EGU General Assembly 2012

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

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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 well-aligned 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.