

Renewing the Geoscience Workforce - Critical Issues and Approaches for the post-2025 Workforce

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Abstract

A critical question facing the geosciences is 'Who will be the geoscientists in the future to address the challenging societal questions that all nations face?' For the last few decades, geosciences have faced a crisis in student interest in the geosciences. There are many causes, including perceptions relative to the rigor of the geosciences, concern about long-term employment opportunities, and a general lack of interest in science and mathematics. At the same time, there is a generational shift in the geoscience workforce. In the developed world, the baby boomer generation is leaving the workforce in all sectors providing opportunities for replacement by a younger generation. In the U.S. alone, the demand will outstrip supply by approximately 150,000 to 200,000 positions in the geoscience workforce within ten years. Though domestic expectations are that the US could import the talent, the data shows otherwise. Demand for geoscientists in the developing world is increasing and will compete for the global supply of geoscientists. Solutions to these problems require a comprehensive understanding of both the supply and demand of the geoscience workforce as well as an understanding of the dynamics of career choice. Issues of substitution, innovation, and entrepreneurship are central to the future of the geosciences after 2025.

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)
- **15,000** total new graduates over the next 10 years
- Or **45,000** total new graduates if you hire B.S. level
- **Net deficit** of over **150,000** by 2021

Core Challenges

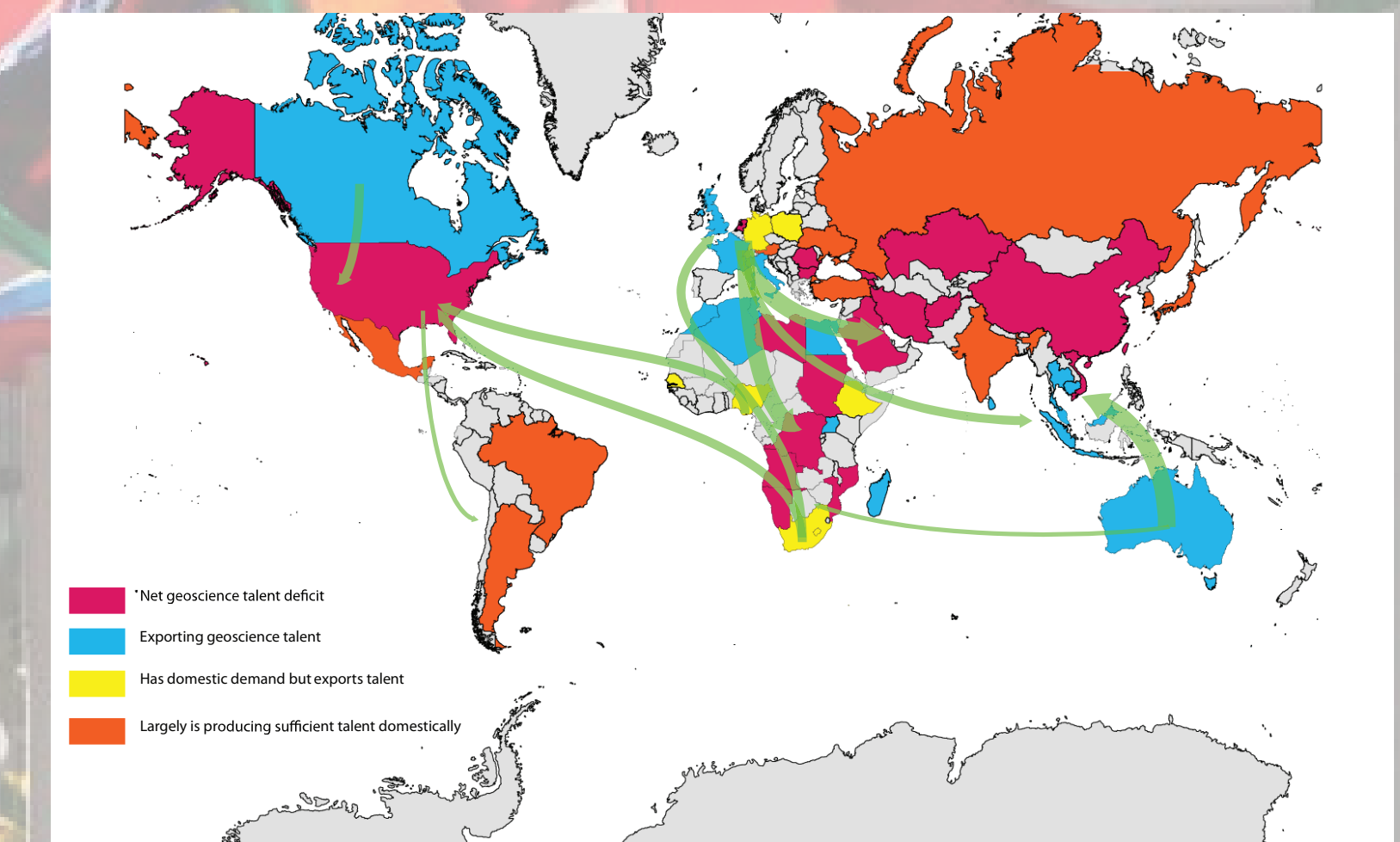
- **Decrease student attrition**
Geoscience major to career is 13% (half of other STEM fields)
- **Import talent**
This isn't Information Technology....
- **Expand domestic capacity**
- **Funding sources**
- **Quality of input**

A Global Workforce, but Globally Mobile?

Where are Geoscientists?

- US: 250,000
- Russia: 80,000
- Europe: 60,000
- China: 45,000
- Canada: 35,000
- Africa: +10,000
- South America: ?
- Middle East: ?
- India: ?

Geoscientists migrate, but the path changes constantly



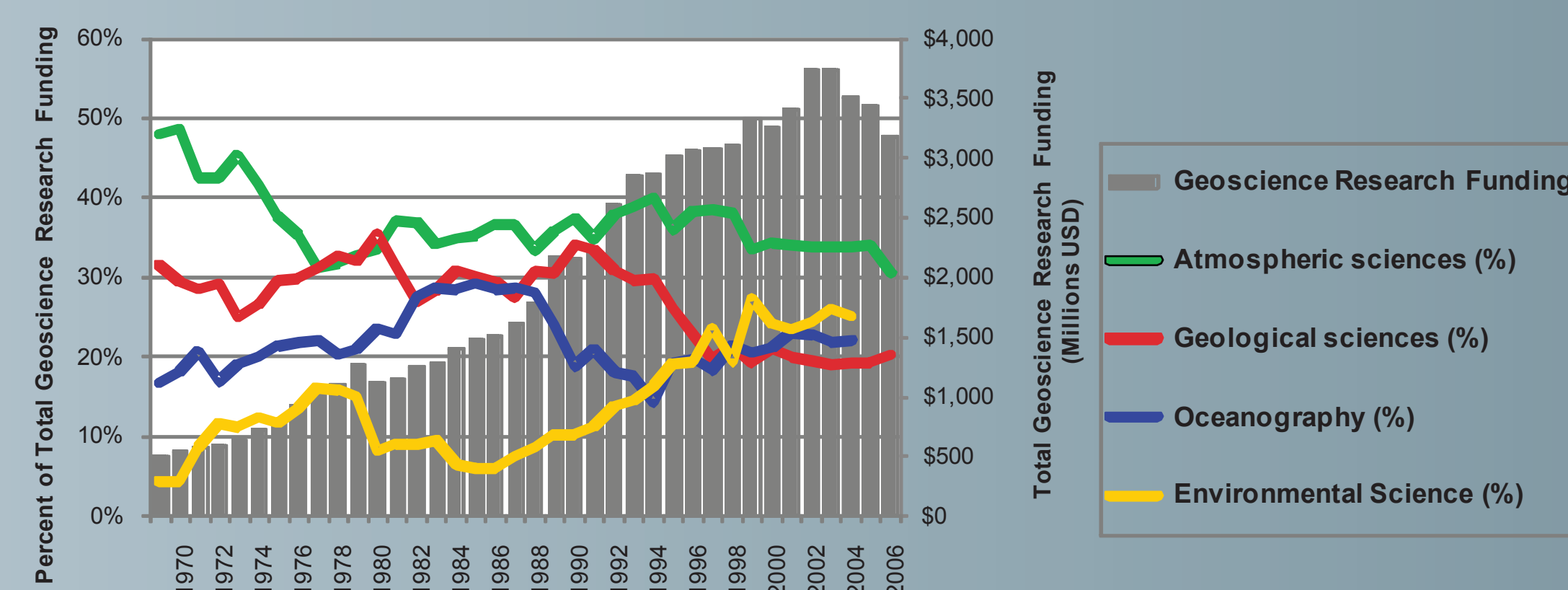
A schematic of geoscientist migration trends in 2010. They have since evolved and will continue to evolve.

Capacity Building - A US Example

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?

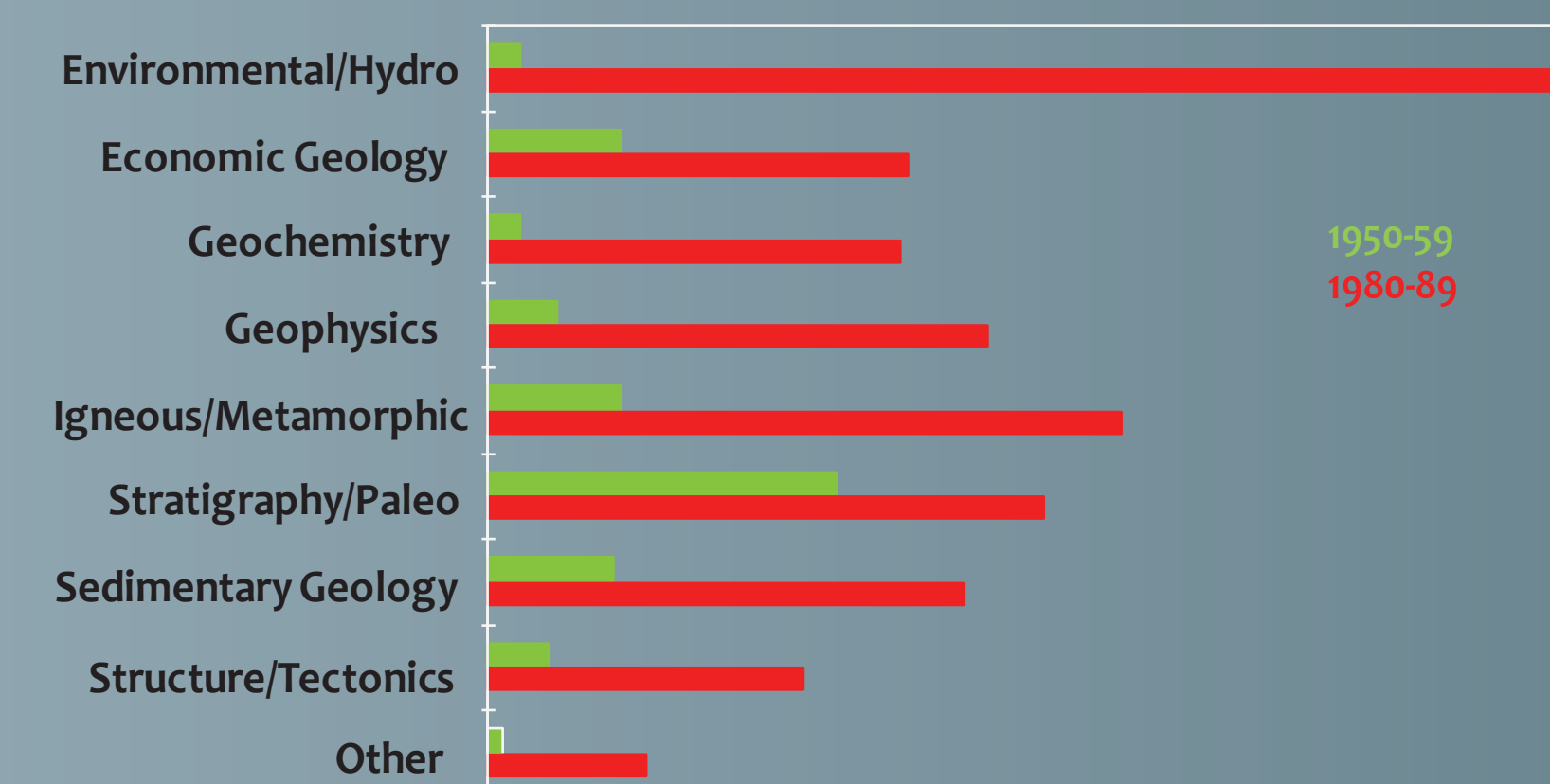
What research is being funded....

Total Geoscience Research Funding by Subdiscipline



What we are producing....

U.S. Theses and Dissertations by Topic



Source: GeoRef

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 stagnant, and that growth will be global and opportunities require mobility

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