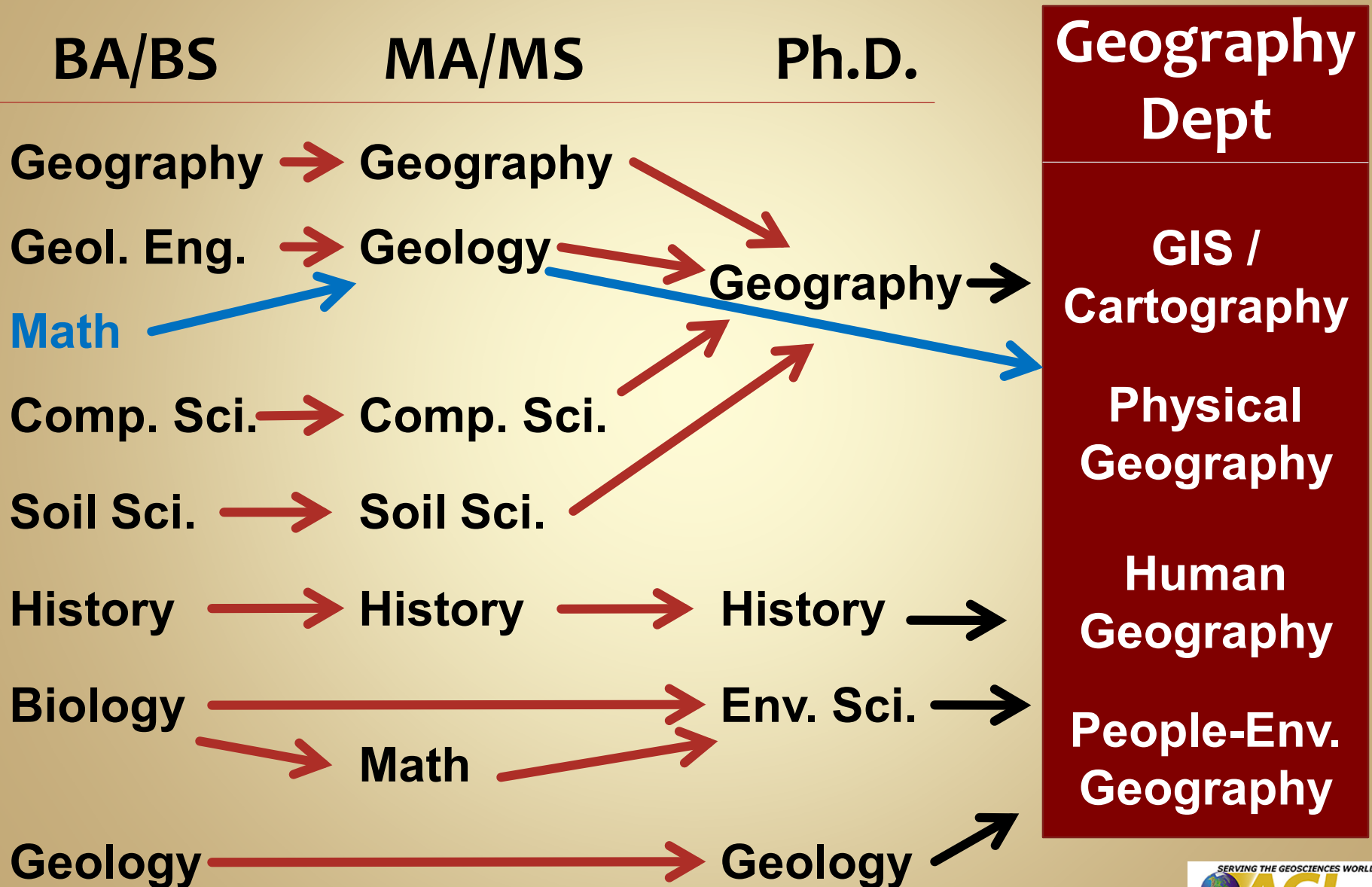


Pathways between Geography and Geoscience

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Alma Mater Questions



Connections and Overlaps

- Geography / Geoscience definitions
- Academic departments
- Degree backgrounds
- Occupational pathways

Defining the Geosciences

Geoscientists, Except Hydrologists and Geographers

- **Study the composition, structure, and other physical aspects of the earth.**
- May use geological, physics, and mathematics knowledge in exploration for oil, gas, minerals, or underground water; or in waste disposal, land reclamation, or other environmental problems.
- May study the earth's internal composition, atmospheres, oceans, and its magnetic, electrical, and gravitational forces.

- *U.S. Bureau of Labor Statistics – Occupational Employment Statistics*

Defining Geography (1)

Geographers

- **Study nature and use of areas of earth's surface, relating and interpreting interactions of physical and cultural phenomena.**

Conduct research on physical aspects of a region, including land forms, climates, soils, plants and animals, and conduct research on the spatial implications of human activities within a given area, including social characteristics, economic activities, and political organization, as well as researching interdependence between regions at scales ranging from local to global.

-U.S. Bureau of Labor Statistics – Occupational Employment Statistics

Defining Geography (2)

Cartographers and Photogrammetrists (*GIS Specialists*)

- Collect, analyze, and interpret geographic information provided by geodetic surveys, aerial photographs, and satellite data.
- Research, study, and prepare maps and other spatial data in digital or graphic form for legal, social, political, educational, and design purposes.
- May work with Geographic Information Systems (GIS). May design and evaluate algorithms, data structures, and user interfaces for GIS and mapping systems.

-U.S. Bureau of Labor Statistics – Occupational Employment Statistics

95% of all U.S. Geography programs specialize in GIS.

GIS is a recommended skill for Geoscientists.

Academic Programs

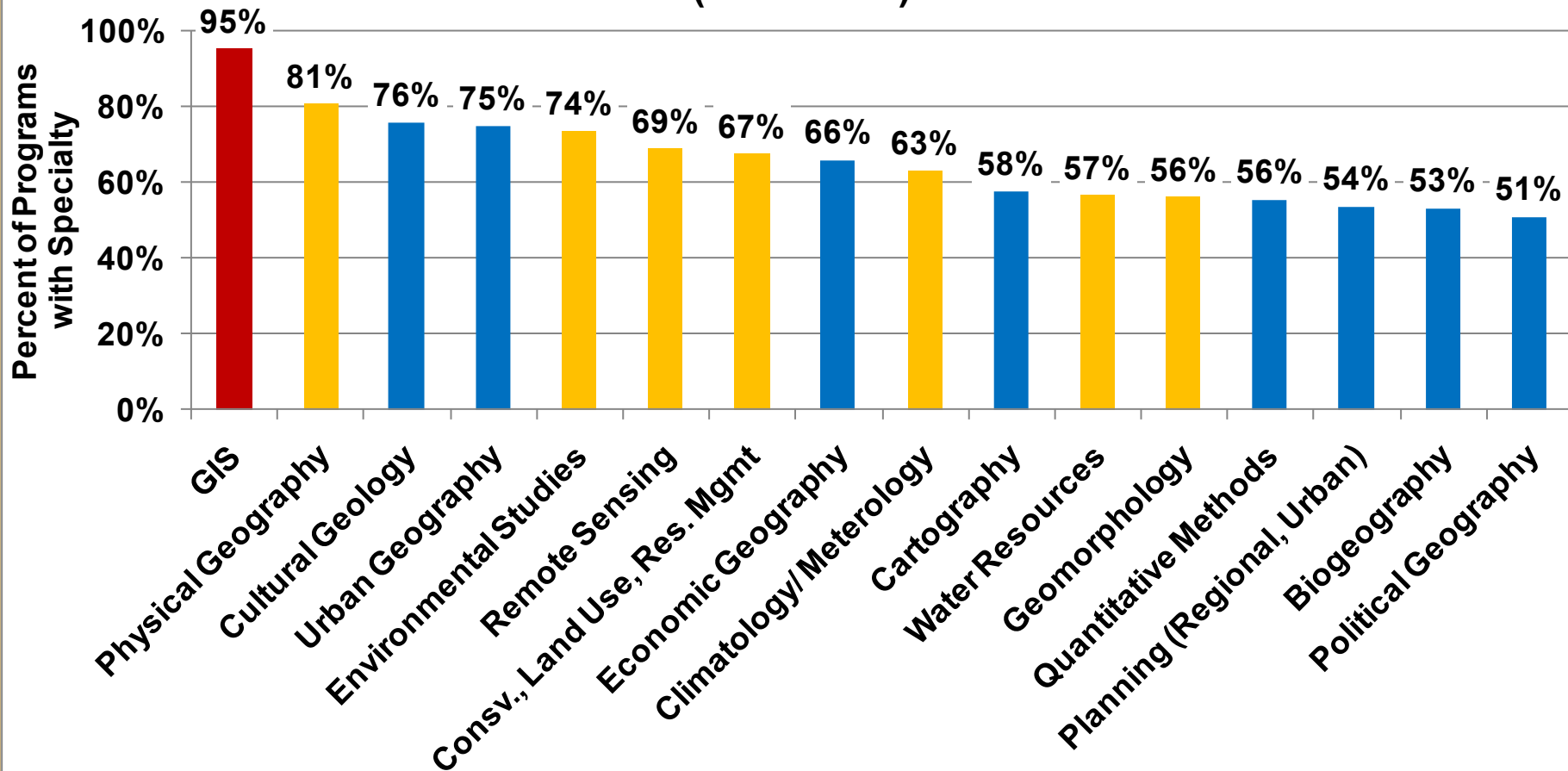
AAG Guide: Program Specialties

Agricultural Geography	Gender	Political Geography
Applied Geography	Geographic Education	Population Geography
Biogeography	Geographic Theory	Quantitative Methods
Cartography	Geomorphology	Recreation and Tourism
Climatology/ Meteorology	<i>GIS (complimentary)</i>	Regional Development
Conservation, Land Use, Resource Management	Hazards	Remote Sensing
Cultural Ecology	Historical Geography	Rural Geography
Cultural Geology	Location Theory	Social Geography
Economic Development	Medical Geography	Transport. and Comm.
Economic Geography	Physical Geography	Urban Geography
Environmental Studies	Planning (Regional, Urban)	Water Resources

9 of 33 specialties overlap with Geoscience specialties

Academic Programs

Most Common Specialties for U.S. Geography Programs (2009-2010)



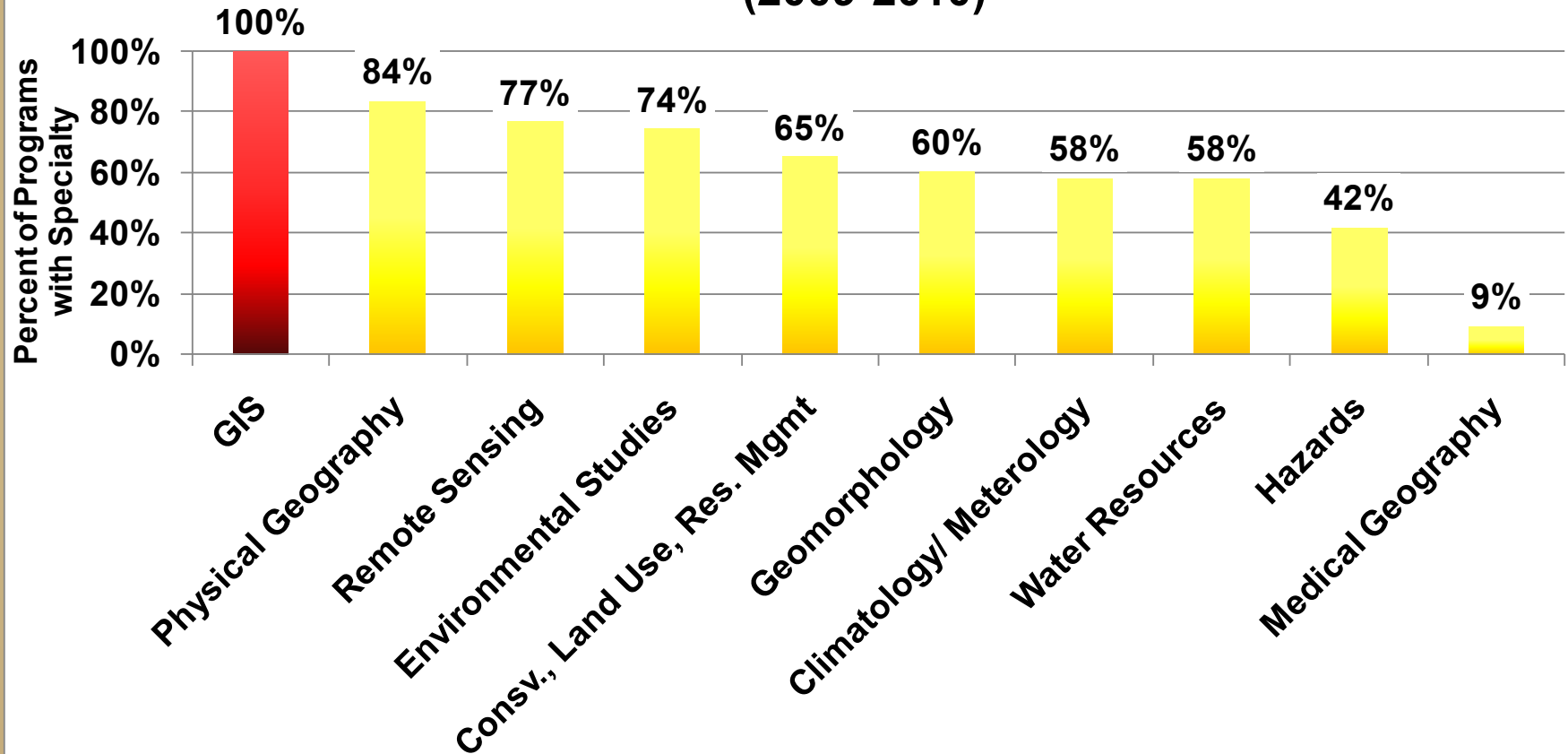
Data derived from AAG's Guide to Geography Programs in the Americas, 2009-2010

Total number of U.S. Programs = 212

96% of all U.S. Geography departments have at least one geoscience specialty overlap.

Geography-Geoscience Programs

**Geoscience Specialty Overlaps for
U.S. Geography-Geoscience Programs
(2009-2010)**



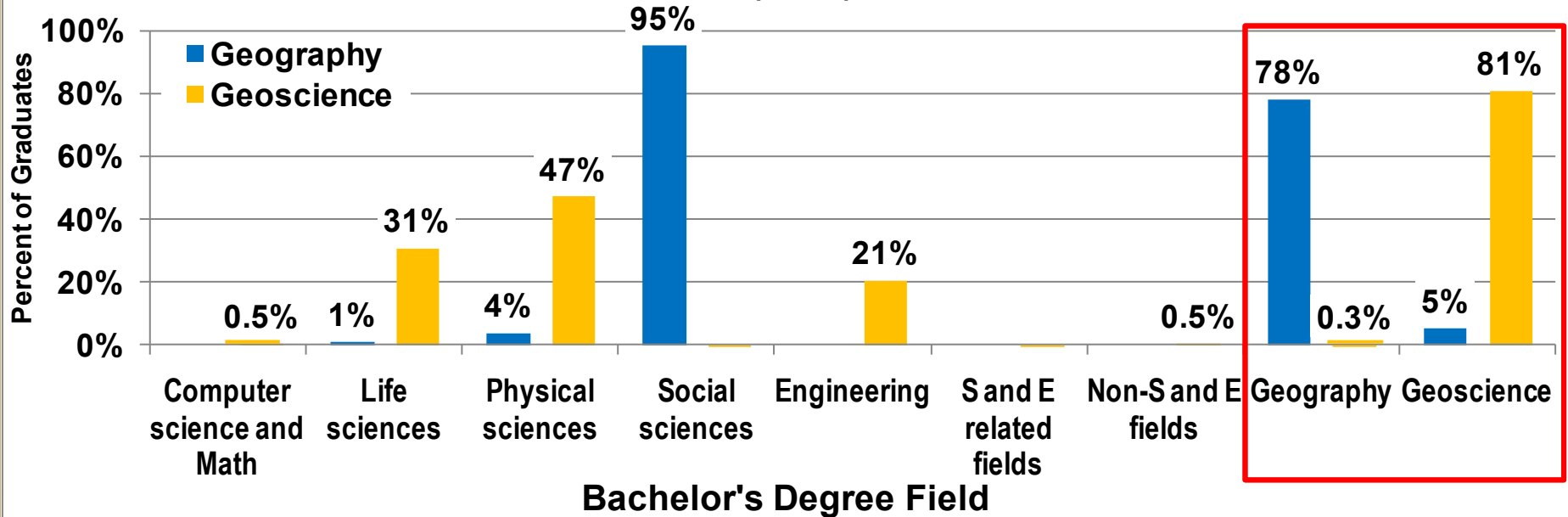
Data derived from AAG's Guide to Geography Programs in the Americas, 2009-2010

n= 43

22% of U.S. Geography departments (47 of 212) are co-located with Geoscience departments.

Degree Backgrounds

Degree Background of Geography and Geoscience Graduates
Highest Degree: Bachelor's
 (2006)



Source: AGI Geoscience Workforce Program. Data derived from NSF SESTAT 2006 database. SESTAT is the Scientists and Engineers Statistical Data System. The use of NSF data does not imply NSF endorsement of the research, research methods, or conclusions contained in this report.

5% Geoscience → Geography

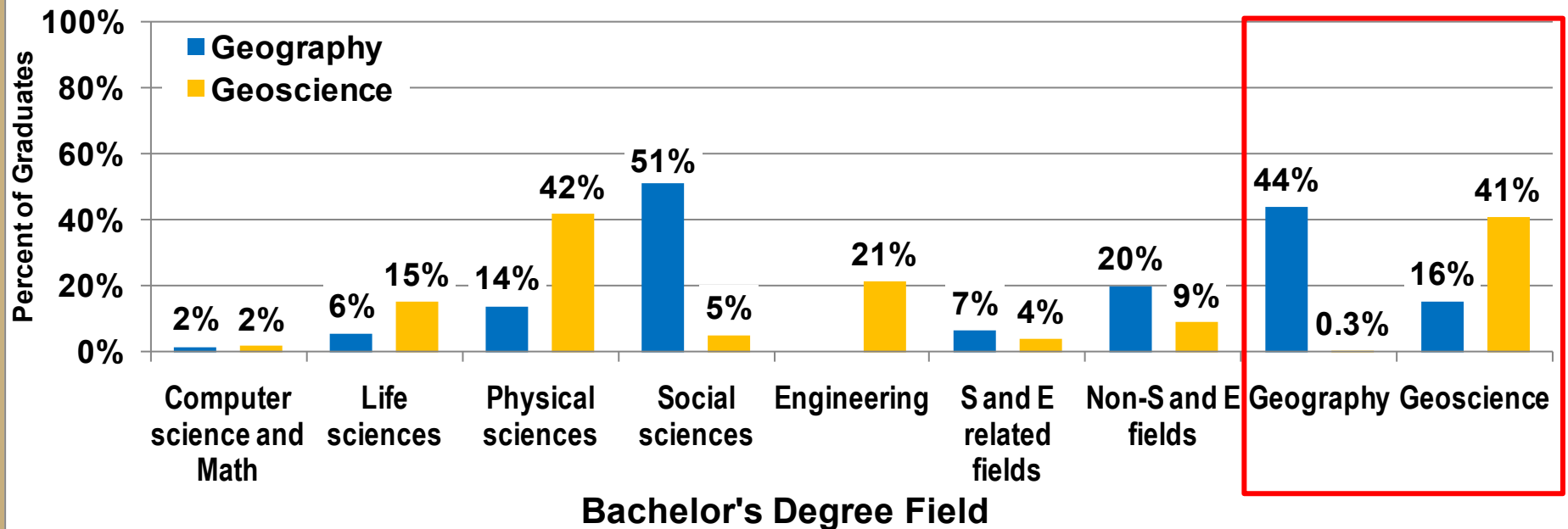
0.3% Geography → Geoscience

Geography: n=101,054

Geoscience: n=271,267

Degree Backgrounds

Degree Background of Geography and Geoscience Graduates
Highest Degree: Master's
 (2006)



Source: AGI Geoscience Workforce Program. Data derived from NSF SESTAT 2006 database. SESTAT is the Scientists and Engineers Statistical Data System. The use of NSF data does not imply NSF endorsement of the research, research methods, or conclusions contained in this report.

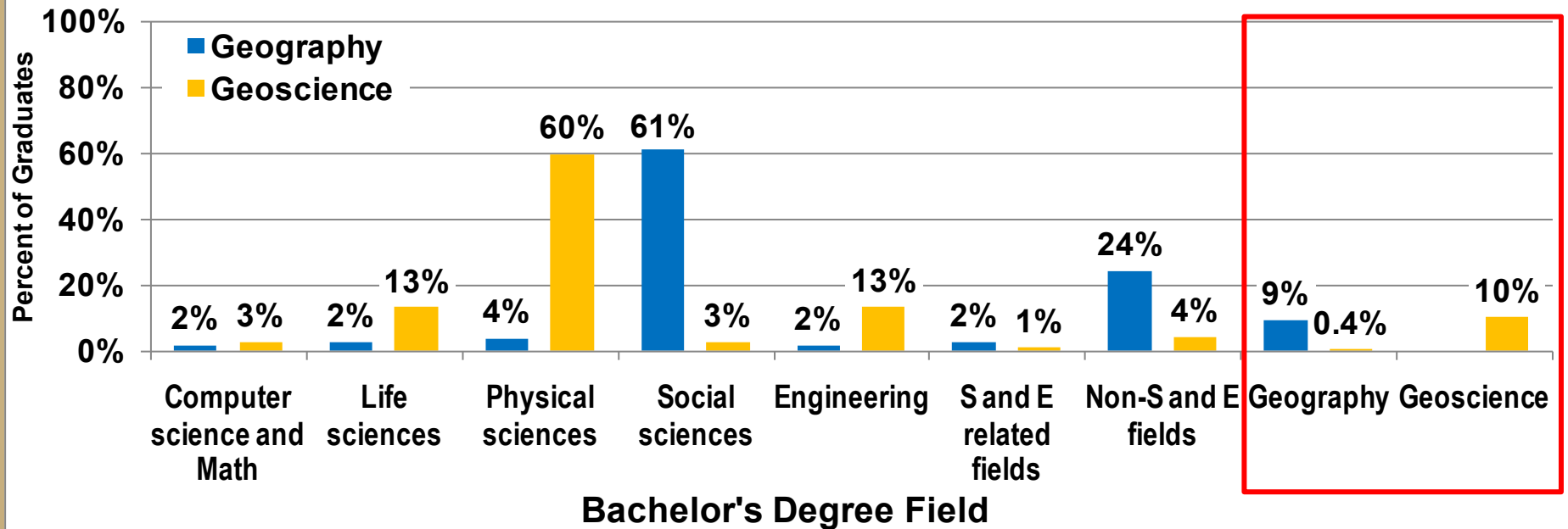
16% Geoscience → Geography

0.3% Geography → Geoscience

Geography: n=21,093
 Geoscience: n=116,865

Degree Backgrounds

Degree Background of Geography and Geoscience Graduates
Highest Degree: Ph.D.
 (2006)



Source: AGI Geoscience Workforce Program. Data derived from NSF SESTAT 2006 database. SESTAT is the Scientists and Engineers Statistical Data System. The use of NSF data does not imply NSF endorsement of the research, research methods, or conclusions contained in this report.

0% Geoscience → Geography

0.4% Geography → Geoscience

Geography: n=4,929
 Geoscience: n=27,648

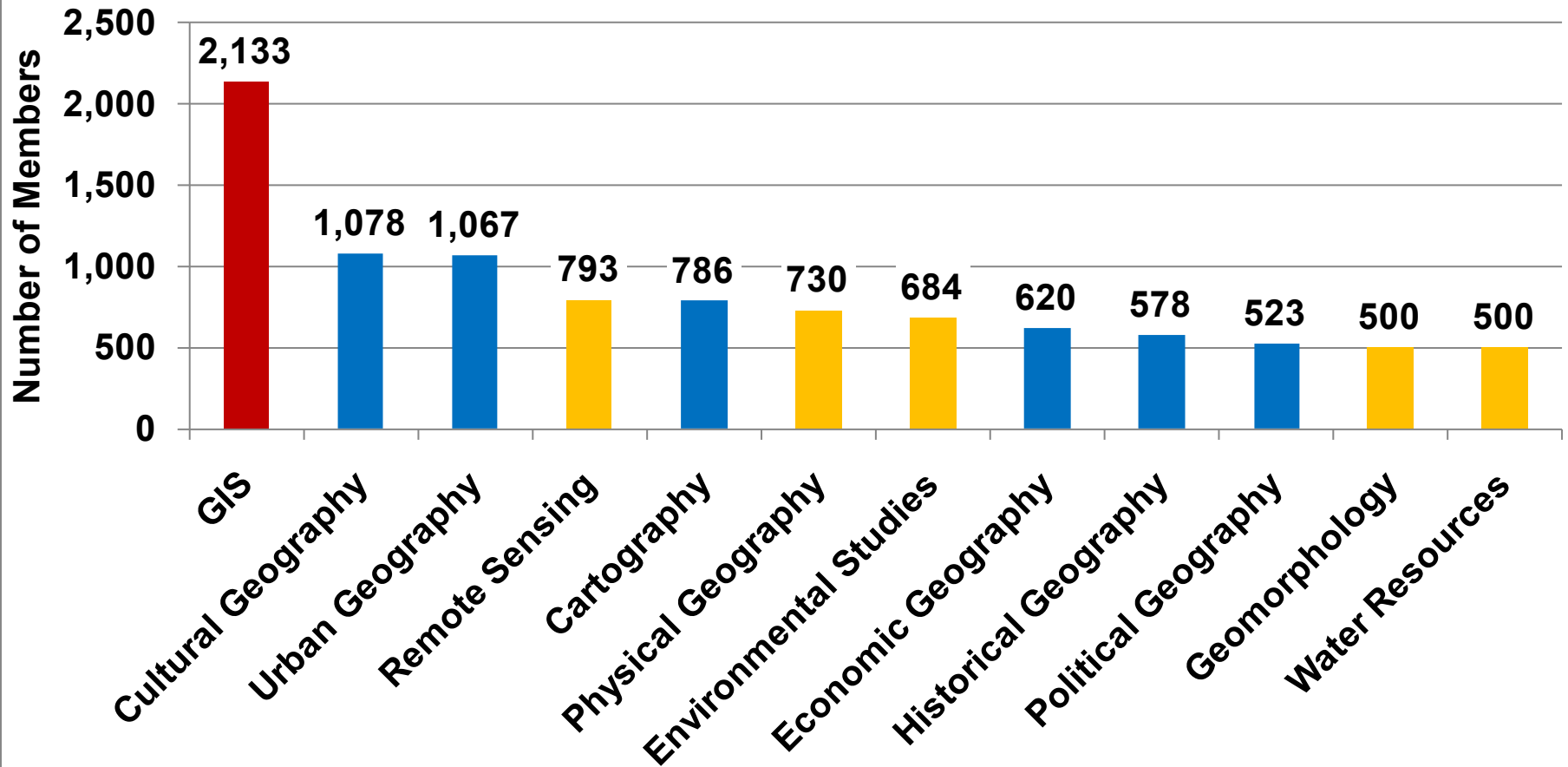
AAG Occupational Categories

Occupational Categories				
Admin	Economic Development	Geographic Theory	Marketing Geography	Regional Planning
Agricultural Geography	Economic Geography	Geomorphology	Medical Geography	Remote Sensing Resources
Applied Geography	Educational Geography	Global Change	Military Geography	Geography
Arid Regions	Energy	Hazards	Mountain Environments	Rural Geography
Biogeography	Environmental Perception	Historical Geography	Oceanography	Social Geography
Cartography	Environmental Planning	History of Cartography	Physical Geography	Soils Geography
Climatology	Environmental Science	History of Geography	Political Geography	Teaching Techniques
Cultural Ecology	Environmental Studies	Land use and conservation	Population Geography	Transport and Comm
Cultural Geography	Field Methods	Librarianship	Quantitative Methods	Urban Geography
Developmental Studies	Gender	Location Theory	Recreational Geography	Urban Planning
Earth Science	GIS	Marine Resources	Regional Geography	Water Resources

31% of categories overlap with Geoscience specialties (17 of 55 specialties)

AAG Membership Employment

Occupational Categories of AAG Membership



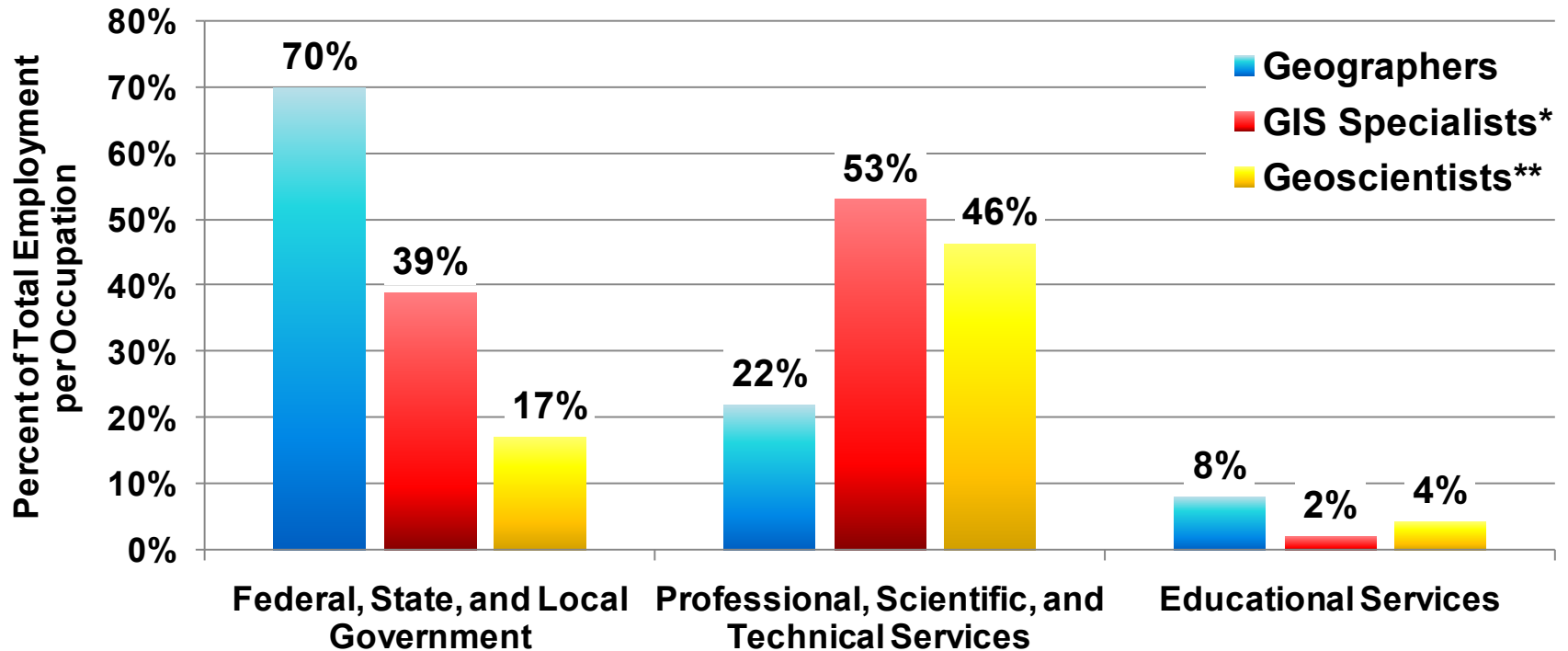
Source: AAG Membership Directory

n=19,928

32% of members (6,280) are categorized in specialties that overlap with Geoscience specialties

Major Employment Sectors

Major Employment Sectors for Geographers and Geoscientists (2008)



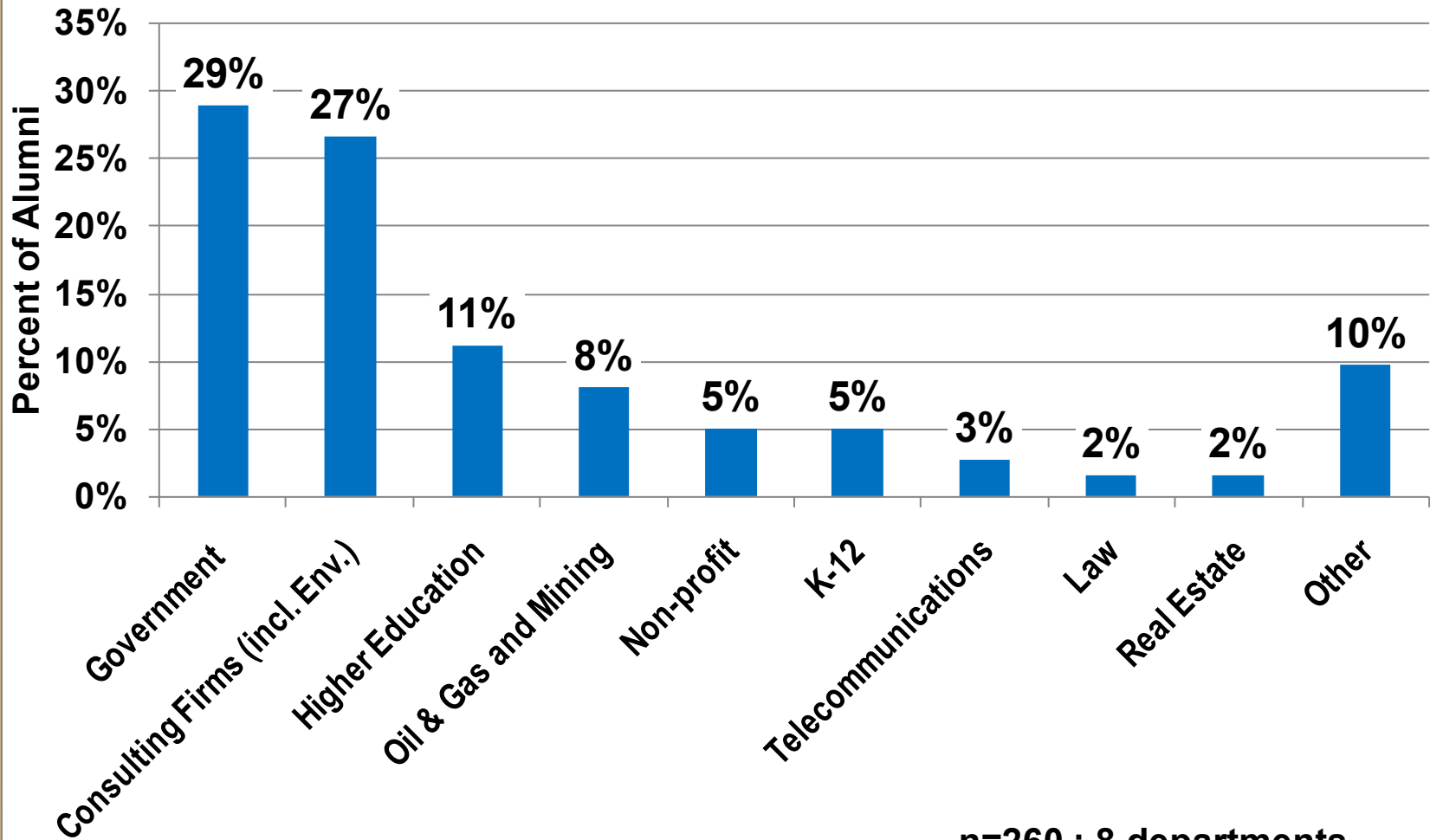
Source: AGI Geoscience Workforce Program. Data derived from the US Bureau of Labor Statistics OES 2008 database.

* GIS Specialists in BLS = Cartographers and Photogrammetrists

** Geoscientists: 19% work in the Oil and Gas industry;
6% work in the Mining industry

Geography-Geology Alumni

Occupations of Geology-Geography Alumni

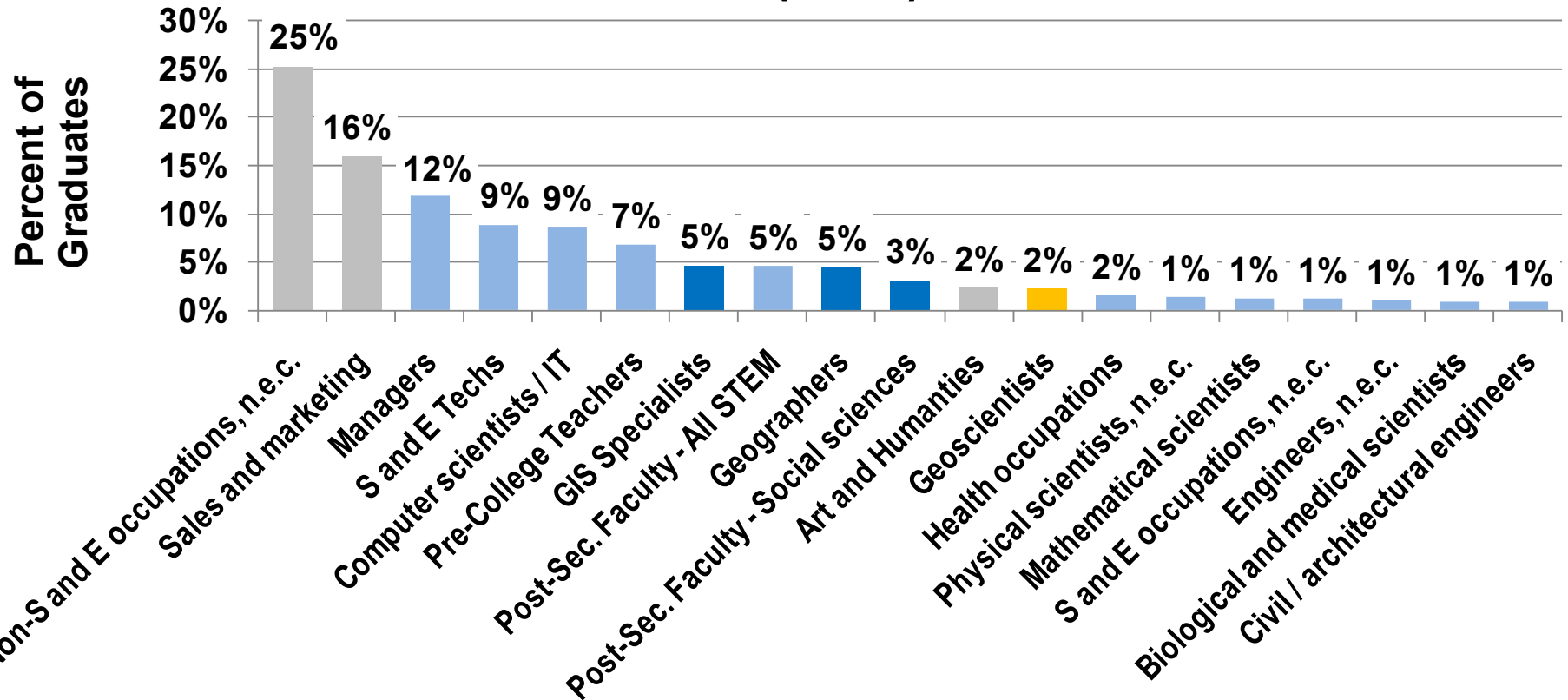


n=260 ; 8 departments

Source: Geography-Geology Alumni Departments

Working Inside/Outside Core Area

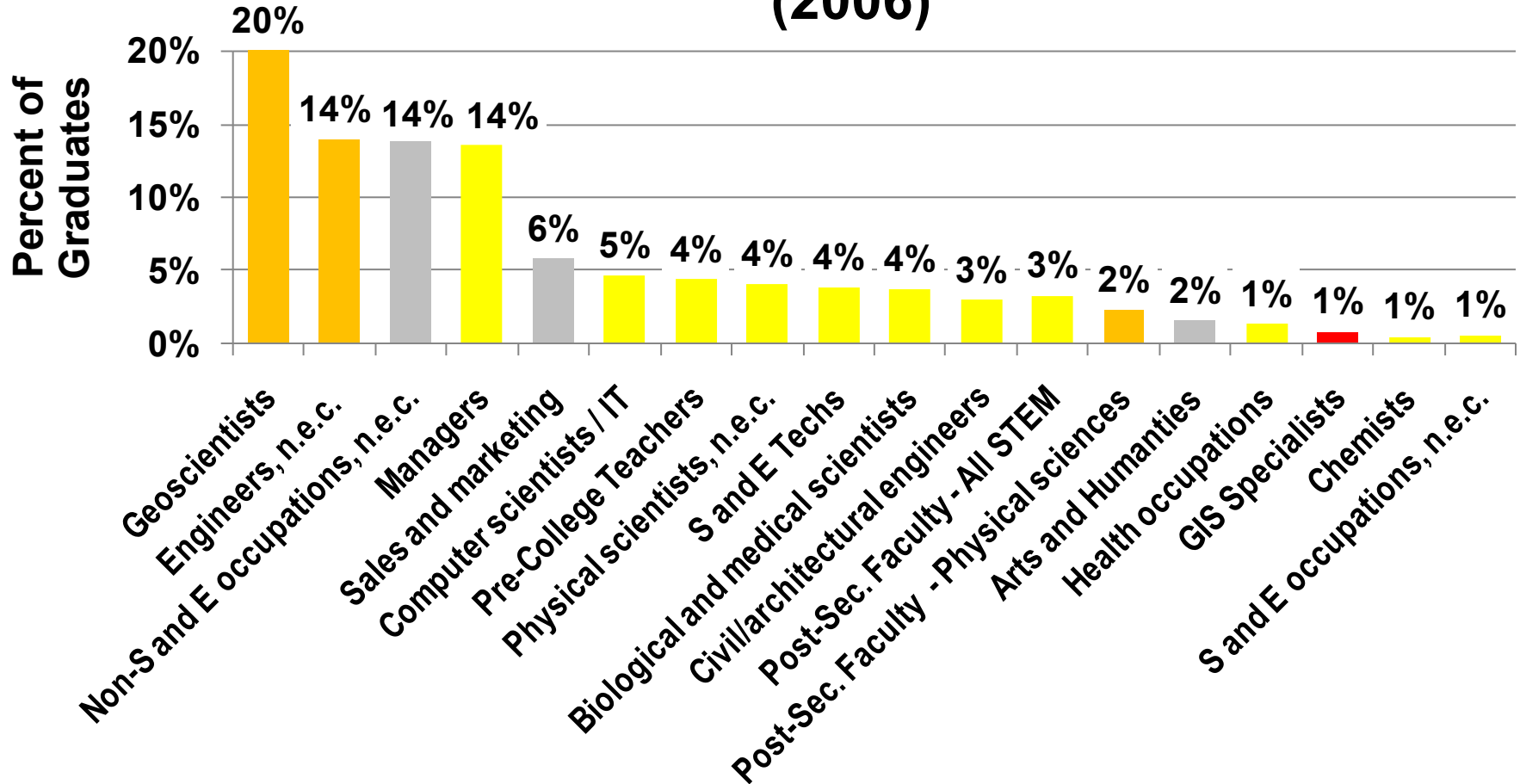
Where Do Geography Graduates Work? (2006)



Source: AGI Geoscience Workforce Program. Data derived from NSF SESTAT 2006 database. SESTAT is the Scientists and Engineers Statistical Data System. The use of NSF data does not imply NSF endorsement of the research, research methods, or conclusions contained in this report.

Working Inside/Outside Core Area

Where Do Geoscience Graduates Work? (2006)



Source: AGI Geoscience Workforce Program. Data derived from NSF SESTAT 2006 database. SESTAT is the Scientists and Engineers Statistical Data System. The use of NSF data does not imply NSF endorsement of the research, research methods, or conclusions contained in this report.

Wrapping it up

- **Departmental connectivity between disciplines**
 - 96% of Geog. depts. have at least one specialty overlap
 - Physical geography: 2nd most common specialty (81%)
 - 22% of Geog. depts. co-located with Geoscience depts.
- **Undergraduate flow from Geoscience to Geography**
 - Bachelor's level: 5% Geoscience → Geography
 - Master's level: 16% Geoscience → Geography
 - 0.3% from Geography → Geoscience
- **Some connection in occupational categories**
 - 32% of AAG's membership works in category overlaps.
 - GIS and Geoscience national occupational patterns similar.
 - Geographers primarily work outside of core-area and S&E discipline.

Acknowledgements

Funding:

- AGI Foundation

Data Sources:

- American Association of Geographers
- U.S. Bureau of Labor Statistics
- NSF's SESTAT database