Harnessing disruption for change: Transforming the geosciences through innovation and collaboration

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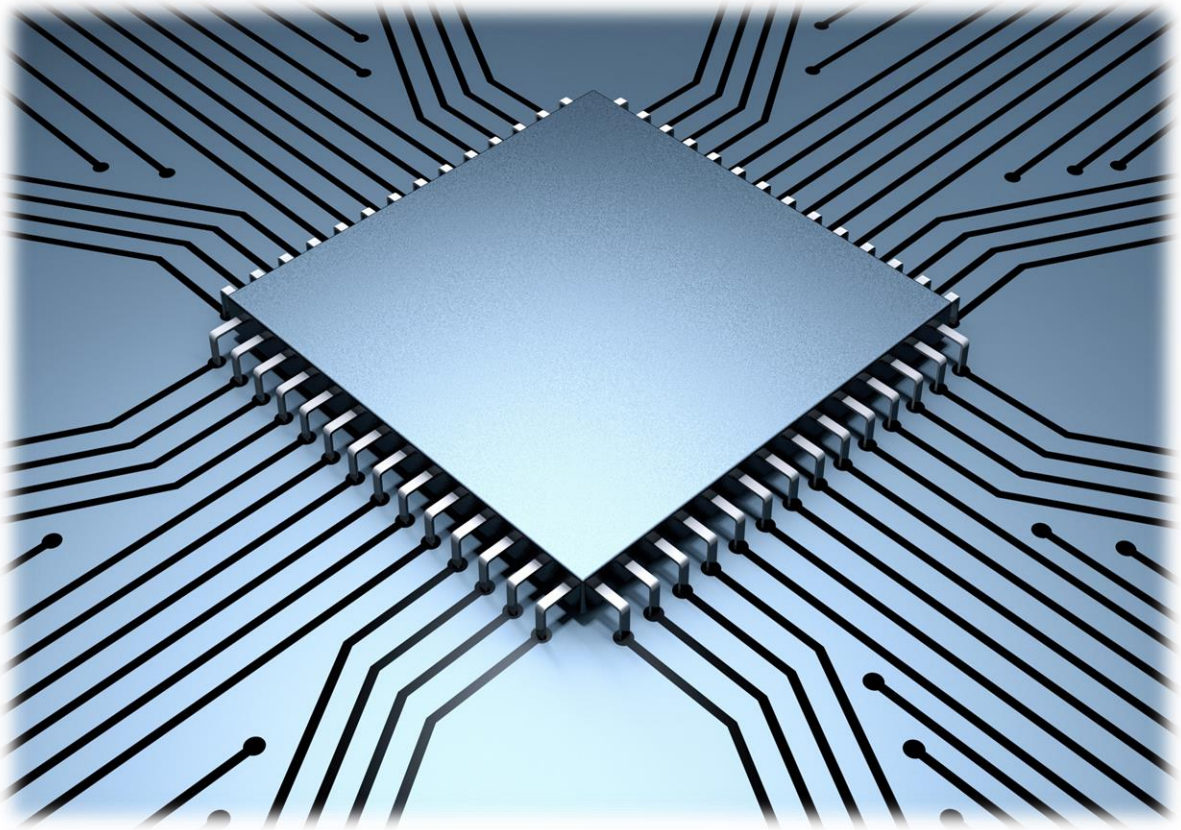
The Disruptors

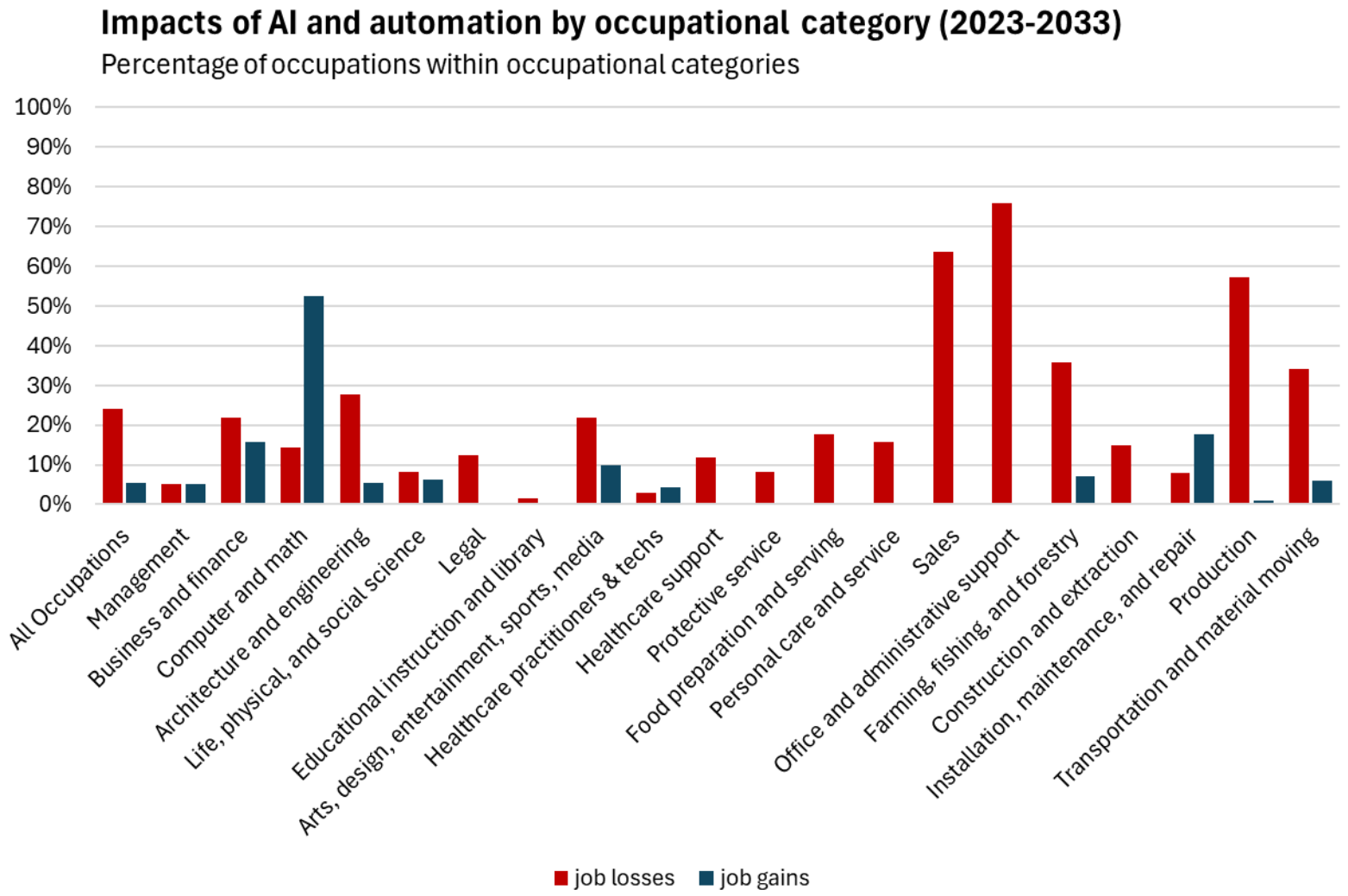


AI & Automation

Climate Change & Hazards

The first wave: AI & automation

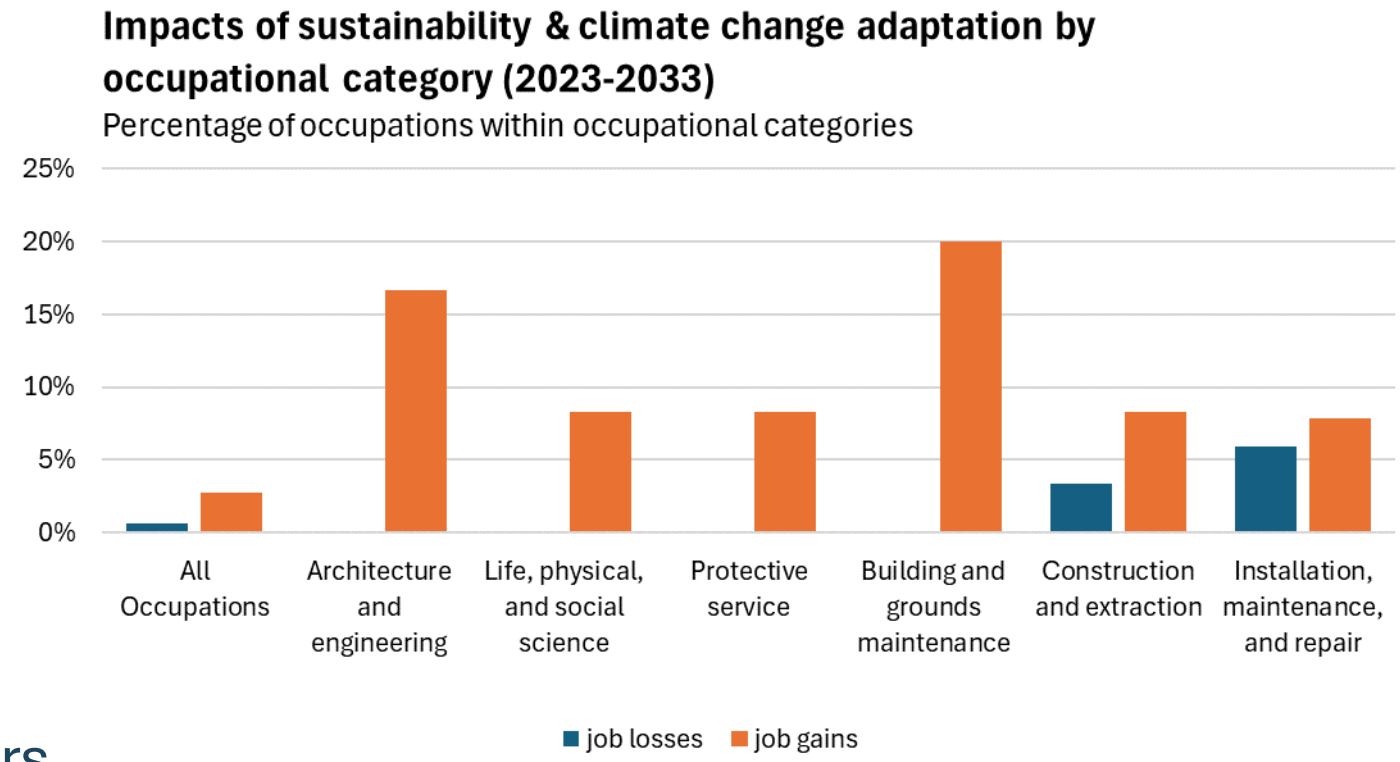
- Nearly all occupational groups in the US will be negatively affected by AI and automation technologies.
- Job losses due to replacement and increased efficiencies.
- Losses will be primarily in middle and low skill jobs.
- Job gains in computer, math and technology-related areas.
- Job losses in geoscience
  - Technician jobs
  - Hydrologists
- Jobs are evolving with new skillsets and application spaces.



Source: US BLS Employment Projections

The next wave: climate & sustainability

- Small number of occupational categories impacted, primarily job gains.
- Job growth focused on
  - Transition to renewable and electrified sources
  - Sustainability-related regulations
  - Hazard mitigation & preparedness
- Job gains in geoscience
  - Environmental scientists & engineers
  - Conservation scientists



Source: US BLS Employment Projections

Vectors for Change

When used together, these interdependent factors lead to solutions that promote resilience.

First thoughts…

The Role of Geoscience in Society

Rapid response survey to capture top of mind thoughts and responses about the geosciences now and in the future.

447 usable survey submissions

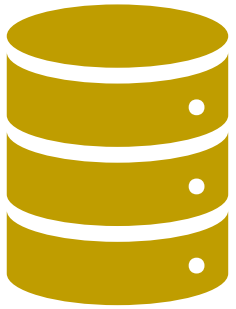
Results reported by career stage:

0-4 yr: Early career

5-10 yr: Early-mid career

10-14 yr: Mid-late career

15+ yr: Late career



Question bank of 56 questions
Topics: career pathways, research, higher education, geoscience profession, societal relevance

30 seconds to respond per prompt

17 randomly selected prompts
5 short responses per prompt

Hazards as inspiration

… a shift in perspective across generations

- **Hazards spark interest and action**

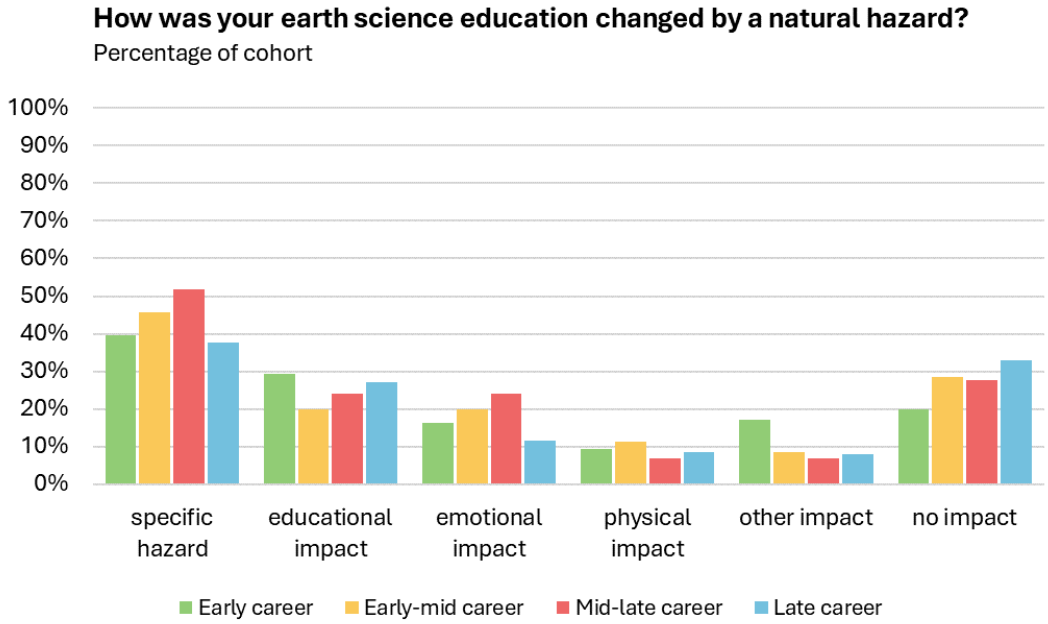
  Degree & career choice, research & curricula

- **Direct experience without severe impacts**
- **Focus shift from local to global**

  Late career: Mt. St. Helens eruption, Loma Prieta & Northridge (CA) earthquakes

  Mid-career: Hurricanes Katrina & Sandy

  Early career: New Zealand, Indian Ocean, and Nisqually (WA) earthquakes, Hurricanes Sandy & Harvey



Geoscience Research Focus

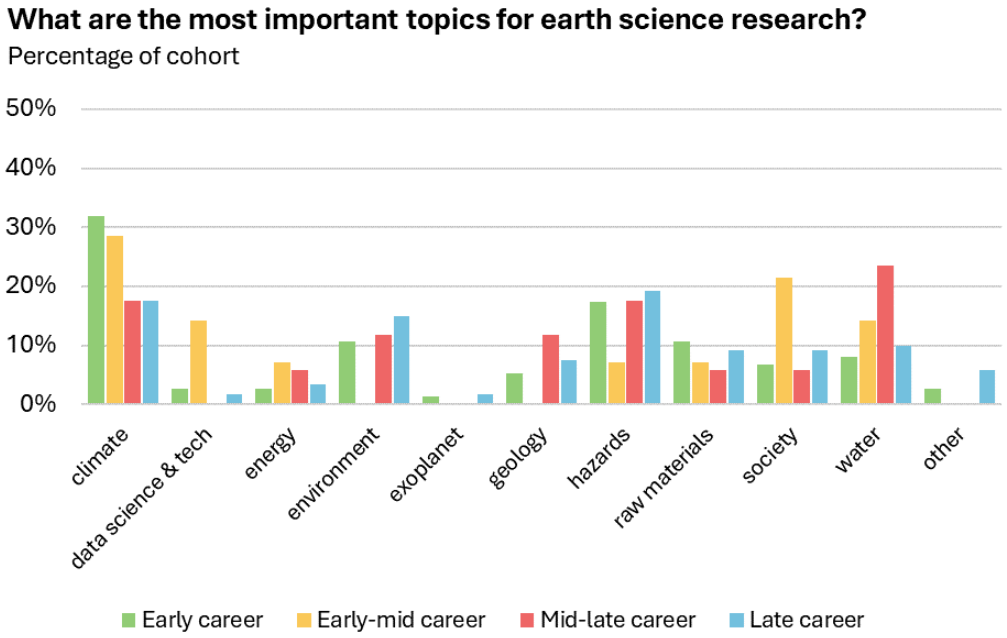
… from theory to application

- **Early career cohorts focus on application**

  Climate impact solutions, hazard mitigation, sustainability, resource allocation, co-production of knowledge with communities

- **Mid and late career cohorts focus on theory**

  Topical interest, understanding processes and mechanisms



New Research Horizons

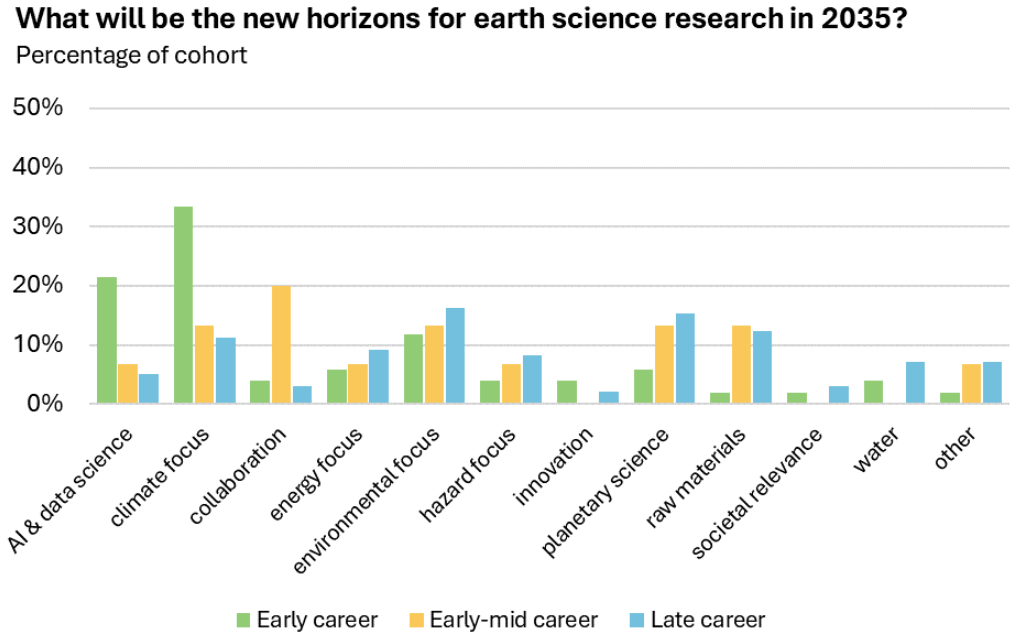
… what is vs. what could be

- **Early career cohorts focus on tools to solve climate & environmental impacts**

  AI and technology as tools to collaboratively solve climate and environmental issues.

- **Mid to late career look to resource management and theoretical research**

  Water, raw materials, earth processes, exoplanets for harvesting and habitation



AI Impacts on Geoscience

… adoption & aversion …

- **Positive expectations**

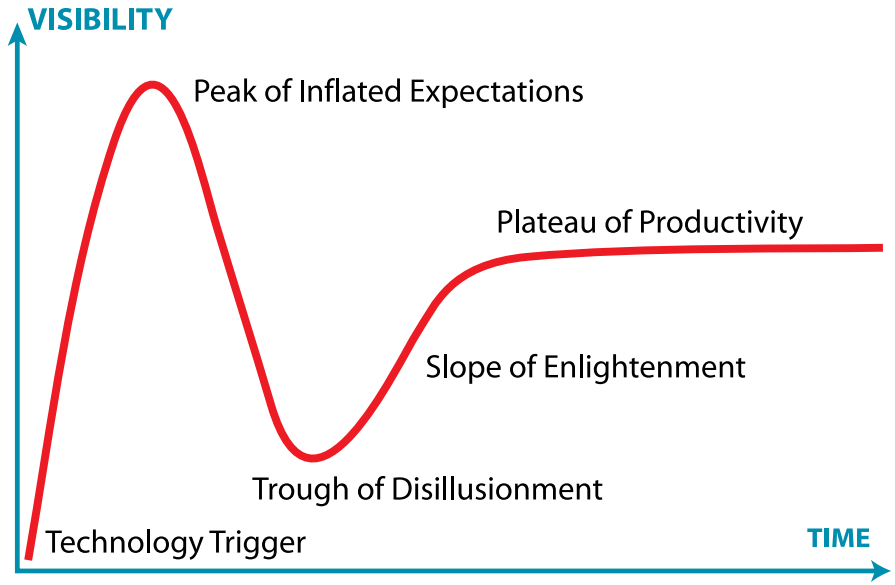
  Recognition of the potential of AI to expand research and create jobs

- **Application spaces**

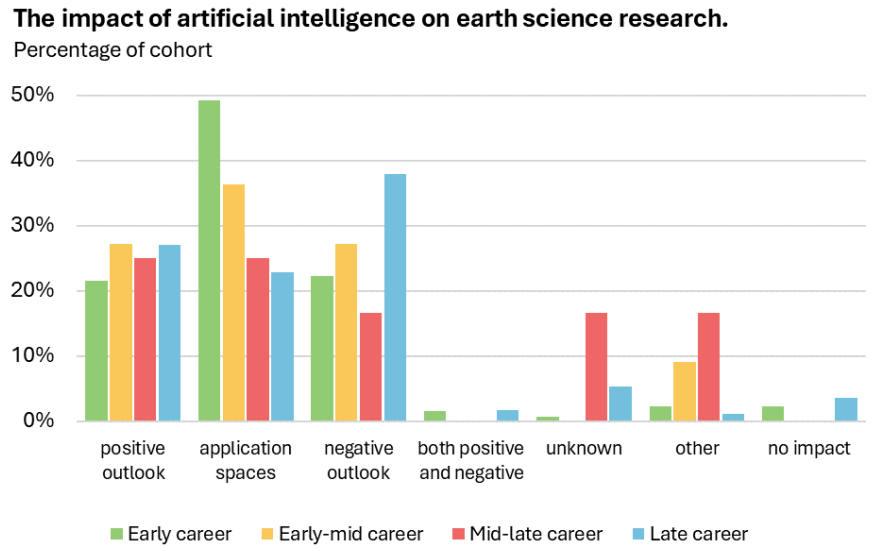
  Information discovery, data analysis & processing, automation & efficiency, communication, reproducibility, idea generation, hazard prediction, visualization

- **Concerns and fears**

  Bias, black box, flawed, fraudulent, invasive, mistrust, not accurate, overblown, risky, scary



Source: https://en.wikipedia.org/wiki/Gartner_hype_cycle



Collaboration needs many perspectives

… and is made possible with technology

- **Diverse perspectives**

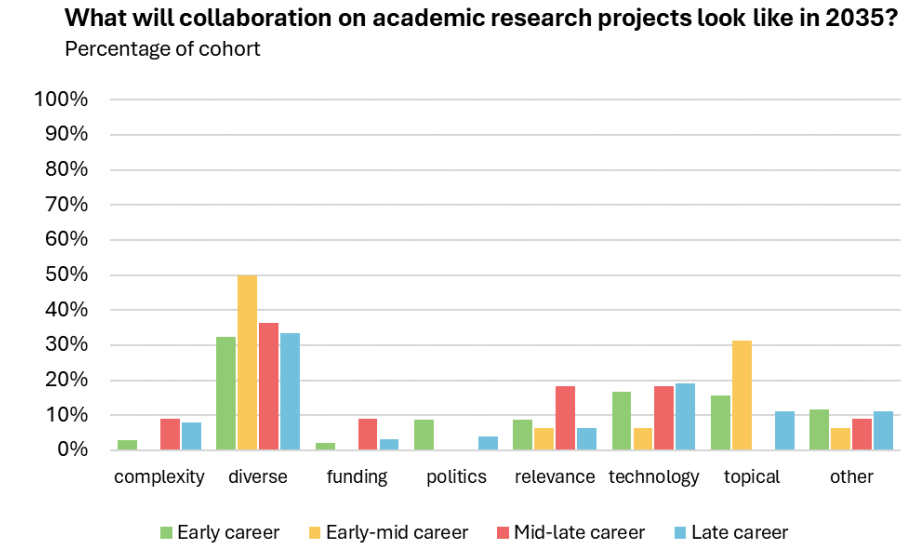
  Institutions, industries, countries, communities, co-produced, equitable, cross-disciplinary

- **Technological integrations**

  Virtual platforms, AI, data-rich projects

- **Topically focused & societally relevant**

  Climate, hazards, environment, energy, raw materials



Application Spaces

New application spaces open when we leverage current technologies to think differently about challenges and identify possible solutions.

Does Hazard Risk Influence Your Career Choice?

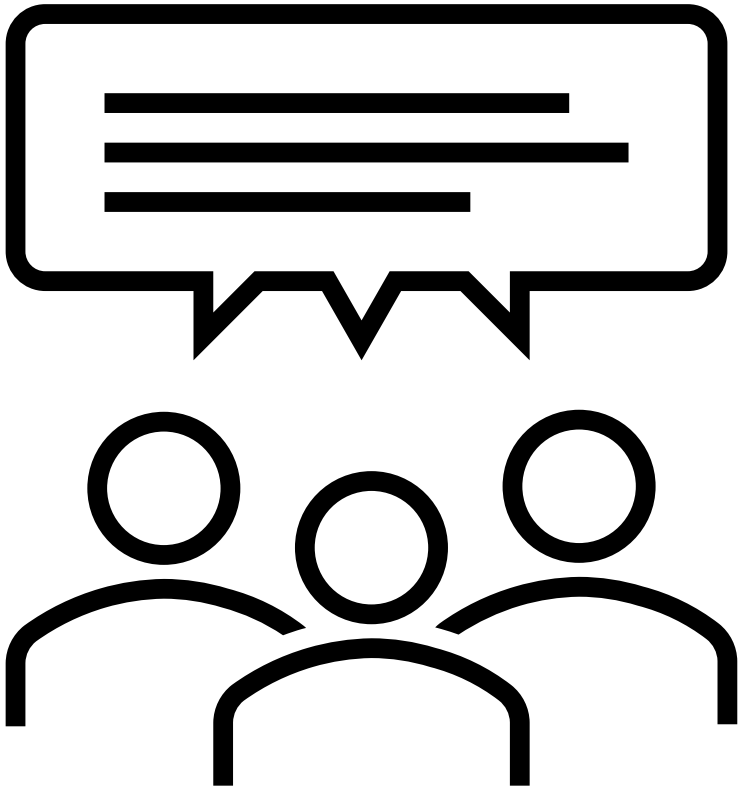
Natural Hazards & Job Choice game

https://hazardgame.americangeosciences.org

What factors are important to you in deciding where to live and work?

How influential is hazard risk to your decisions?

Questions?



AGI's GRANDE project data
https://grande.americangeosciences.org/data

Natural Hazards & Job Choice Game
https://hazardgame.americangeosciences.org

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