SOCIAL/CULTURAL

Exposure/ knowledge    - Being the "token" minority
Family expectations
What kind of learners are Geology majors.

Isolation and lack of representation.
(Critical mass)

Mentorship - lack of
Not a lucrative position.  (perception/actual)

Environment - nature
Science vs Advocacy tension
Access to green space

Historical - new privilege
(Ecolonizing mindset)

Safety - Unease out in public/ outdoor spaces

Religious discrimination/ Hostile to belief systems

Pedagogical Differentiation

Career Paths/ Info About well-paying jobs

Low visibility of societal relevance of Earth Science
(peers & family)

Stigma of learning disability & mental health
INSTITUTIONAL

- Don't know "unwritten rules" to email advisors beforehand
- SAT/GRE Prep can be super-expensive & inaccessible advantage of that resource
- Institution still uses this metric despite evidence there are better predictors
- Rewards so-called "high achievers", affects trajectory of students
- Students may not know who offers programs, or even which ones exist
  - Who gets this information can be biased
- Administration has been focused on it like a business
- Conference/Travel reimbursement assumes that money is no object
  - Lay out funds first, long time to reimbursement
- Silos for departments around campus, lack of communication, no space for interdisciplinary collaboration
- Physical accessibility of campus, of fieldwork sites, lectures/active learning
- Accessibility of pedagogy: vocabulary barrier
- Issues with mental health support, accessibility, infrastructure for faculty and students
- Too big class sizes means less interaction/support from faculty
- Financial resources of institution
- No/little accommodation of religious holidays
- Hostile work climates
- Unequal distribution of power
- Lack of credit for mentoring/value of D&I work
- No jargon syllabi
- Uneven distribution of D&I work/mentoring
OTHER

and LOGISTICAL

Cost of highered
family leave/support
exclusivity/sense of belonging
getting to class/field trips/work
work-life-balance
navigating the process at all levels
financial literacy and access
digital divide
inspiration (lack thereof) role models
non-transparent support structures
judgement of career paths
Political influences
travel barriers (passports, IDs, Visa's)
FIELD

- Access (Proximity to home)
  - Familiarity with nature not equal
- Disability - visible and invisible
  \[ \text{Also fitness level} \]

- "Culture" of field geology
  \[ \downarrow \text{Lack of institutional policies} \]
  \[ \downarrow \text{Group norms} \]

- Economic Barrier (low-income)
  \[ \downarrow \text{Students + institutions} \]
  \[ \downarrow \text{Camping gear} \]

- Camping experience/Field prep
  \[ \downarrow \text{Fear of outdoors} \]

- Cultural affirmation - decolonizing mentality
  \[ \downarrow \text{Different opportunities for unsafe spaces (sexual harassment above)} \]

- Safety (environment, harassment/bullying) \[ \rightarrow \text{Alcohol} \]

- Instructor training on cultural competence (Awareness, familiarity)

- Living accommodations for non-gender conforming students (women)

- Assumptions about health & hygiene

- Family perception of fieldwork
ACADEMIC

- Faculty (mis)perception about student ability
- Male-dominated majors
- Group dynamics in group work/projects
- Peer (mis)perception about student ability
- Stereotype threat & microaggressions
- Hidden curriculum/academic norms
- Imposter Syndrome
- Asking for help - without mentor in faculty
- Lack of representation/unequal mentoring responsibility
- Isolation (being the "only one") no networks or how to use
- Societal value/relevance
- First-gen (no support) or transfer students
- Low visibility of career opportunities
- Traditional classroom/lecture style
- Lack of (geo) science in K-12
- Gatekeeping prevent further movement
- Competitive culture
INSTITUTIONAL

Tuition Cost < Workforce
Lack of data on jobs/salaries of recent grads
Recruiting
Admissions Process
Infrastructure Funding
K-12 Prep inequity
Equity
Dual system of education
 Advising
Inclusion in guided pathways
Lack of analysis at intrastate/region scale
Risk aversion to actually solving these problems
Closure of programs coming from diversification/policies restricting geo prog
Administrative support & resources & willingness
Lack of transparency to institutional processes
Lack of knowledge/awareness/exposure to geosciences
Legalized academic hazing
More partnerships
FIELD

- lack of exposure to the outdoors
- unfamiliarity
- access ✓
  → physical
  → financial
  → personal responsibilities
- fear
- isolation
- program requirement
- field challenges
- historical segregation with restrictions on outdoor activity
- field culture

- identity
  → having to be outdoorsy
  → limited mobility
  → transportation
  → supplies
  → additional tuition & fees
  → job
  → family care

limited connectedness
→ particularly in rural areas
→ being "other"

social
→ hygiene
→ nutrition
→ hydration
→ creature comforts
→ fatigue

ritual of passage
→ drinking
→ masculinity
→ endurance + fitness

regional
→ weather/season
→ timing

experience
planning
communication
OTHER

- Parental pressure/concern without complete knowledge of potential geoscience career options
- What even is geosciences? Students may not know what it includes
- Guidance counselors have lack of knowledge of E.S.
- Role of industry/museums/etc. in communicating opportunities/careers
- Peer acceptance
- Deficit minded approach to student success rather than appreciating diversity of experience or situation
- Sense of belonging/self-efficacy
- Place based affluence provides intro to geo where affluence lacking connection to geo missing
- Science 'Purism' - social elements not seen as relevant.
- Sexism
- Racism/Bias (implicit + explicit)
- Imposter Syndrome
LOGISTICAL

Navigating pathway transitions

Navigating academic culture especially for 1st gen students

Access to information and mentoring

Personal scholarships

Financial resources

Childcare

Time Family responsibilities

Need to work

Communication needs

Public infrastructure

Transit

Hard commute

Fieldwork experiences

Access to equipment/academic resources

Distance learning

Partnerships

Identify nurture shared mission

Geography
SOCIAL/CULTURAL

- STEM as low context → lack of connection/community perspective
- Lack of exposure (students & families)
- Solo status — feeling like you have to represent group
- Teacher recommendations ✓
- Lack of social capital (family members didn’t go to college or grad school)
- Lack of peer acceptance (camaraderie)
- Educator challenged to navigate in PWI or MSI or HBCU
  - putting food on table vs. science exploration
  - people all need to contribute vs. making relevant to values/priorities into geoscience
  - lack of stories & representation of people of color
- Cultural context for “outdoor work” vs. “prestigious” careers (labor)
Academic model doesn't support many student pathways

**ACADEMIC**

- URM students not perceived as capable
- Not in K-12 as "core" build throughout the curriculum
- Lack of respect for the class/discipline

- Misconceptions about
  - Lack of Earth Science Educators
  - Rigor & value of E.S.
- Classroom dynamics and not knowing how to ask for help
  - Help/Office hours not at good times
- Ignorance of career paths
- Lack of emphasis of unifying/cross-cutting concepts
- Lack of authentic experience in courses
  - Training & resources
- What people care about isn't integrated in courses (societal relevance)
- Role models/teachers don't look like you
- Lack of connections to diverse departments
- Preparing graduate students to engage with broader community work