

# What are the Ethics of Going into the Field?

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## Introduction

abridged from:

Marcia Bjornerud, 2018, Ch. 5

Timefulness: How Thinking Like a Geologist Can Help Save the World  
(Princeton University Press)

Copyright Oleg Lopatkin  
Pederneira Mine, Minas Gerais, Brazil  
([www.mindat.org/photo-170767.html](http://www.mindat.org/photo-170767.html))



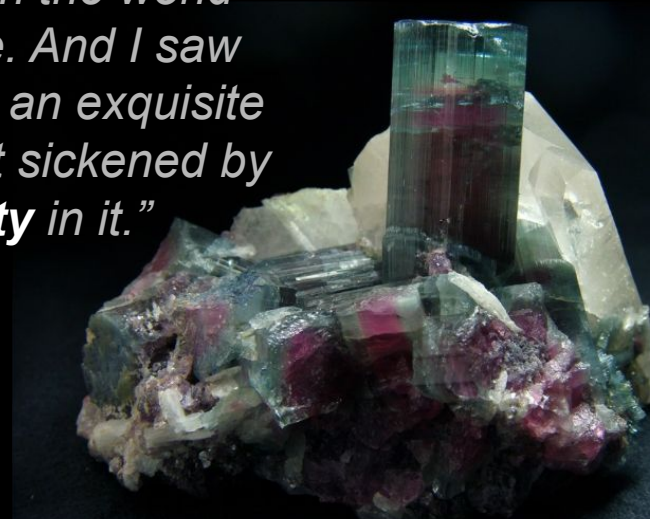
*“At most U.S. colleges and universities, earning a degree in geology requires completion of a rite of passage called **“field camp.”** ... Even though Minnesota has plenty of interesting rocks of its own, our field camp was set in the spectacular Sawatch Range of central Colorado. We had a **day off** each week, and during one of those times of sweet liberty, a group of us set out on a long hike to explore **an old pegmatite mine** we had heard about... The pegmatite we were hunting was an old one, formed in Mesoproterozoic time... We found the road into the abandoned mine diggings—hesitating briefly at the **“No Trespassing” signs**—and followed a string of waste rock piles to a gem pocket... In an instant, we were all seized with a visceral greed, a need to take as many of these treasures as we could... I managed to tap out a few small deep-pink tourmalines, and then spotted a prize: a **perfect watermelon-colored crystal.**”*

Bjornerud, 2018, [Timefulness](#)



*“It was in an awkward corner close to the ceiling of the excavation, with little room for wielding a hammer, but **I was determined to have it.** I began pounding away, thinking ahead to how I would display this trophy at home when, **in one errant blow, I smashed it.** In that moment it seemed my vision was suddenly cleared, as if I had been released from a malevolent spell that had engulfed us when we entered the gem pocket. **I abruptly lost my appetite** for the whole enterprise. After several years of immersion in the world of geology, I had developed some sense for Deep Time. And I saw that in an avaricious second I had carelessly destroyed an exquisite thing that had witnessed a third of Earth’s history... I felt sickened by the scene of devastation around me, and **my complicity** in it.”*

Bjornerud, 2018, [Timefulness](#)



→ Discombobulating experiences of complicity can inspire us to change what we are doing.



# Field Ethics and Sampling Checklist



## LAND USE

- Check for rules, regulations, and ownership first
- Obtain necessary permissions and permits



## FIELD STRATEGY

- Only take the samples you need
- Take photos or other alternatives if possible



## IMPACT

- Make sure not to cause permanent damage
- Leave no trace



## ARCHIVING

- Record the locality
- Plan to archive and/or reuse the sample later



## INTEGRITY

- Act responsibly and ethically
- Practice scientific rigor



## GEOHERITAGE

- Respect indigenous cultures and values
- Protect exemplary sites



Focus on geodiversity and geoconservation, and always sample responsibly!

[www.geosociety.org/fieldethics](http://www.geosociety.org/fieldethics)

→ Discombobulating experiences of complicity can inspire us to change what we are doing.

→ **Ethics FOR** being in the field - ongoing energy is good.

Figure from: Chan & Mogk, 2023, Establishing an Ethic of Sampling for Future Generations of Geoscientists. (*GSA Today*)

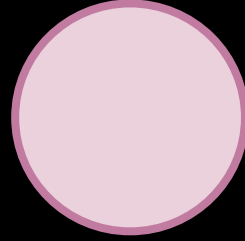
Also awesome: Nyarko, Fore, & Licht, 2023, The role of ethical care in the geosciences: examining the perspectives of geoscience undergraduates. (*Journal of Geoscience Education*)

- **Ethics OF** going into the field - let's explore some radical questions.

# Ethics of Going into the Field - Outline -

## 1. Does geology expertise need to be “out there”?

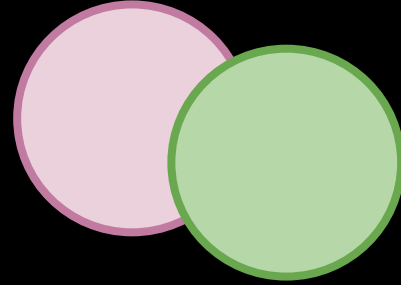
Jenne Schmidt, 2022, Crippling environmental education: rethinking disability, nature, and interdependent futures. (*Australian Journal of Environmental Education*)



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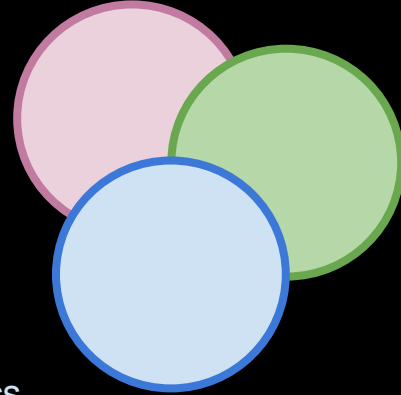
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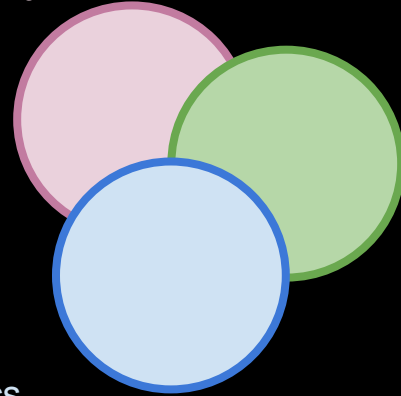
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## 4. Summary and Questions

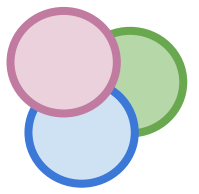
Who are we to talk? (talking since 1998)

Conversations around disability, whiteness, class privilege, nationality, and gender in academic geoscience, asking:

- What are the objectives of field-based pedagogy?
- Is rigorous field experience central to geoscience expertise?



Does geology expertise need to be “out there”?





# Does geology expertise need to be “out there”?

## Photos on homepages of geoscience department websites

Category	n	%
Total Outside	121	81.8
Total Inside	25	16.9
Unknown	2	1.3
Total	148	100

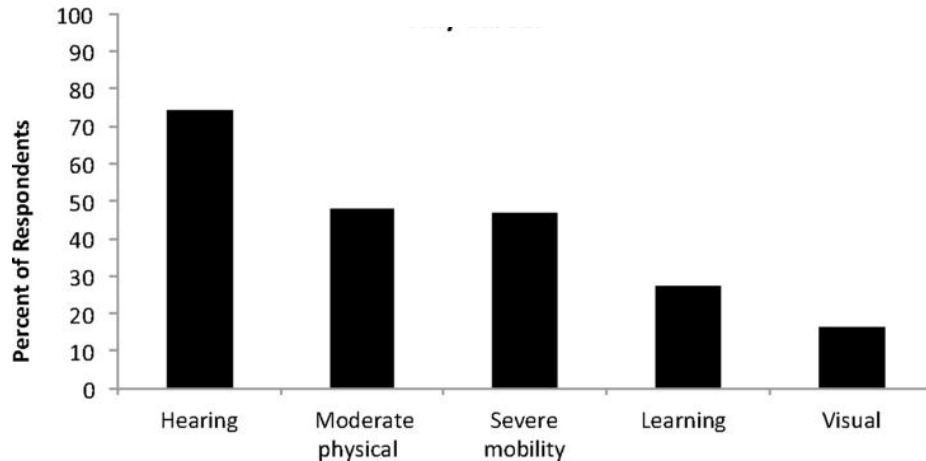
- **4 / 5 images are “out there”**
- ***Message - we learn and work outdoors***

Sexton et alia, 2014, Characteristics and culture of geoscience departments as interpreted from their website photographs. (*Journal of Women and Minorities in Science and Engineering*)



# Does geology expertise need to be “out there”?

## Perceptions of [in]accessibility of any geoscience career for people with disabilities



- 4 / 5 images are “out there”
- *Message - we learn and work outdoors*
- **1 / 2 geologists think geoscience careers inaccessible to physically disabled people due to field work**
- *Message - we are able-bodied*

Atchison & Libarkin, 2016, Professionally held perceptions about the accessibility of the geosciences. (*Geosphere*)



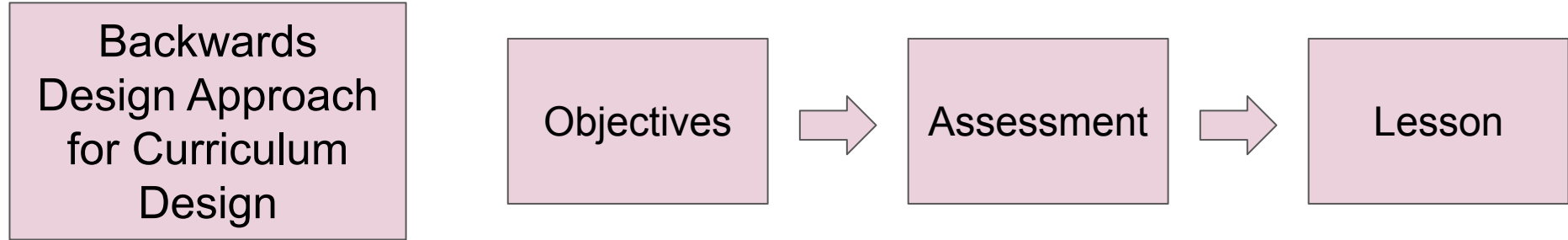
## Does geology expertise need to be “out there”?

*“...within the field of environmental education, disability and madness are ever present even in the silences and omissions... informing conceptions of nature as ‘out there’, regulating how bodies should engage with the environment (i.e. walking, seeing, and hearing) and thus what types of bodies are required for such engagement...In its current rendition, **environmental education functions through compulsory able-bodiedness / mindedness...** [I]t is vital for environmental education to take up a critical disability studies framework... to **create more access, and also in order to open up new ways of being, knowing, seeing, moving, hearing, and sensing the world around us.**”*

(Schmidt, 2022)

Jenne Schmidt, 2022, Crippling environmental education: rethinking disability, nature, and interdependent futures. *(Australian Journal of Environmental Education)*

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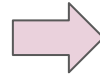


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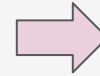


Backwards  
Design Approach  
for Curriculum  
Design

Objectives



Assessment



Lesson



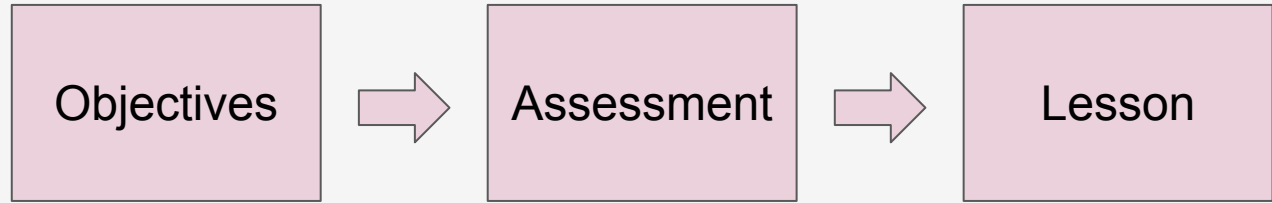
Universal Design for Learning



# Does geology expertise need to be “out there”?



Backwards  
Design Approach  
for Curriculum  
Design



Universal Design for Learning



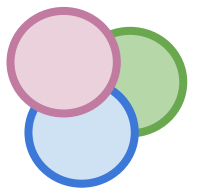
## Does geology expertise need to be “out there”?

- Field-based learning is not equally accessible for all
- Yet geology departments promote (often require) field-based learning, and geologists show strong biases in who can participate
- **How can we explicitly value different ways of knowing and engaging with the Earth?**

Objectives



Universal Design for Learning



## Does geology expertise need to be “out there”?

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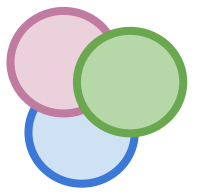
- **What are barriers for at-risk students and colleagues?**

Objectives

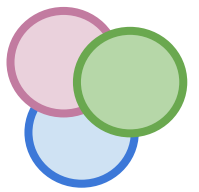


Universal Design for Learning

How can we address barriers to field work for at-risk students and colleagues?



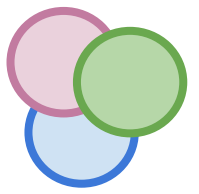
# How can we address barriers to field work for at-risk students and colleagues?



Needs for Safe Fieldwork Strategies:  
example situations experienced by at-risk  
individuals in the field.

Source: Amelia-Juliette Claire Demery and Monique Avery Pipkin, 2021, Safe fieldwork strategies for at-risk individuals, their supervisors and institutions. (*Nature Ecology and Evolution*) \*Illustration by Callie Rodgers Chappell

# How can we address barriers to field work for at-risk students and colleagues?

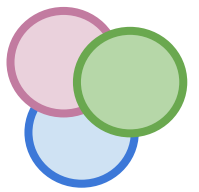


- **A Black ornithologist is approached by law enforcement.**

*“The **isolating and severe burden** of fieldwork risks to minoritized individuals means that **supervisors bear a responsibility** to educate themselves on the different risks posed to their students and junior colleagues in the field.”*

Source: Amelia-Juliette Claire Demery and Monique Avery Pipkin, 2021, Safe fieldwork strategies for at-risk individuals, their supervisors and institutions. (*Nature Ecology and Evolution*) \*Illustration by Callie Rodgers Chappell

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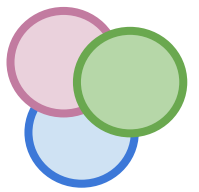


- **A Sikh entomologist experiences a hateful landscape**

*“While many field-based disciplines are aware of the lack of diversity in their cohorts, there may be less awareness of the fact that **career** advancement of minoritized researchers can be stunted or permanently **derailed after a negative experience during fieldwork...**”*

Source: Amelia-Juliette Claire Demery and Monique Avery Pipkin, 2021, Safe fieldwork strategies for at-risk individuals, their supervisors and institutions. (*Nature Ecology and Evolution*) \*Illustration by Callie Rodgers Chappell

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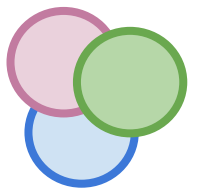
- **A bisexual ichthyologist is accosted by hate speech**

*“This means **asking who is at heightened risk**, including but not limited to those expressing visible signs of their race/ethnicity, disability, sexual orientation, gender identity/expression (for example, femme-identifying, transgender, non-binary) and/or religion... the **condition of being ‘at-risk’ is fluid...**”*

Source: Amelia-Juliette Claire Demery and Monique Avery Pipkin, 2021, Safe fieldwork strategies for at-risk individuals, their supervisors and institutions. (*Nature Ecology and Evolution*) \*Illustration by Callie Rodgers Chappell



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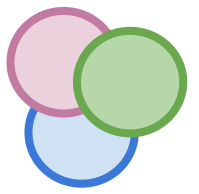


- Field-based learning and working is not equally safe for all
- Strategies need to encourage, honor, and support individuals' needs to feel safe

- **How can we acknowledge and address barriers for at-risk students and colleagues in field-based pedagogy?**

- **A deaf botanist is verbally abused due to her disability.**

# How can we address barriers to field work for at-risk students and colleagues?



- Field-based learning and working is not equally safe for all
- Strategies need to encourage, honor, and support individuals' needs to feel safe
- How can we acknowledge and address barriers for at-risk students and colleagues in field-based pedagogy?

- Are we entitled to parachute science and natural laboratories?

Are we entitled to parachute science and natural labs?



# Are we entitled to parachute science and natural labs?



## **Parachute Science:**

Doing science in another country without collaboration with local community or researchers.

# Are we entitled to parachute science and natural labs?



## **Parachute Science:**

Doing science in another country without collaboration with local community or researchers.

For example, sample sites and country affiliations for authors of publications (1990-2020) in **Paleobiology Database** ([www.paleobio.db](http://www.paleobio.db)) show **biases in sampling and publishing.**

Raja et alia, 2021, Colonial history and global economics distort our understanding of deep-time biodiversity. (*Nature Ecology and Evolution*)

# Are we entitled to parachute science and natural labs?

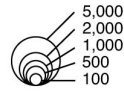
Each circle represents a country.

Size of each circle represents # author affiliations in publications (1990-2020) on fossil material.

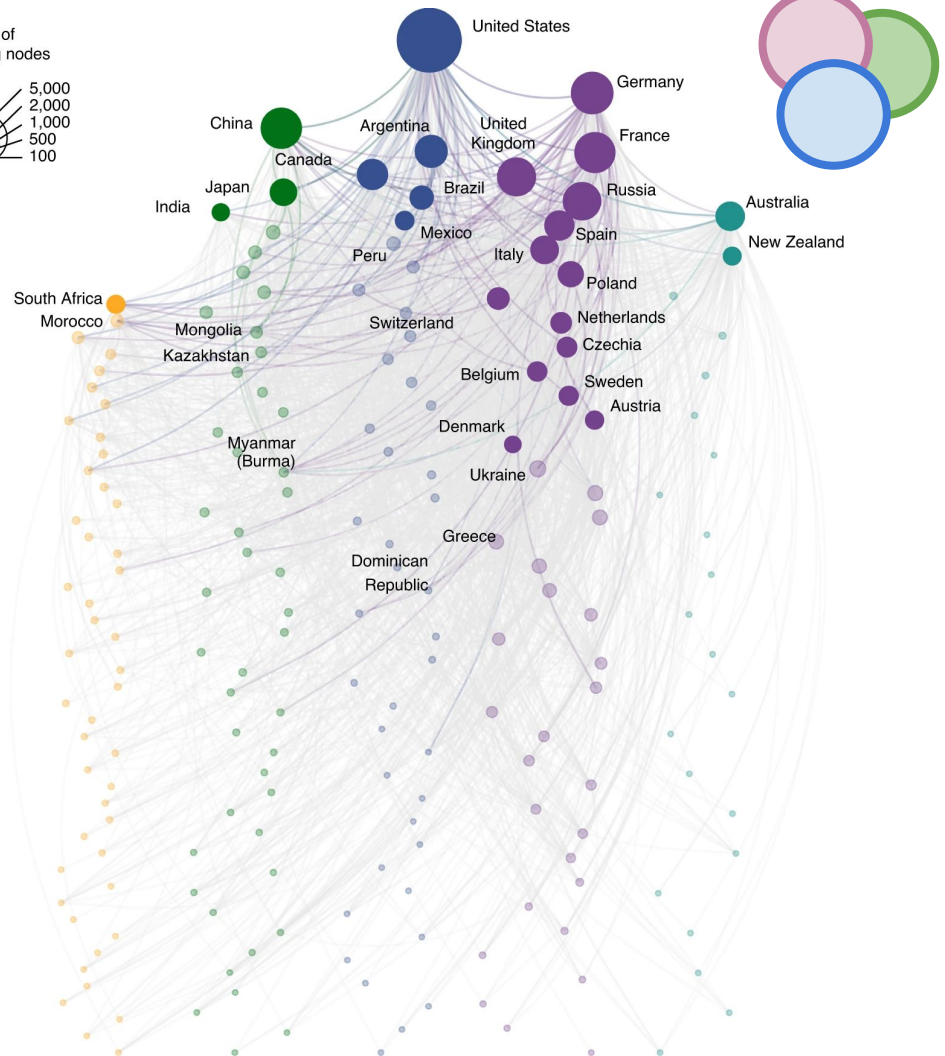
Chords relate author affiliations to fossil site locations.

Raja et alia, 2021, Colonial history and global economics distort our understanding of deep-time biodiversity. (*Nature Ecology and Evolution*)

Number of outgoing nodes



Decreasing number of nodes





# Are we entitled to parachute science and natural labs?

Parachute Science:

Doing science in another country without collaboration with local community or researchers.

**Parachute index =**

**In (pubs including local researchers /  
pubs not including local researchers)**

Raja et alia, 2021, Colonial history and global economics distort our understanding of deep-time biodiversity. (*Nature Ecology and Evolution*)



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In paleontology, these countries experience a **parachute index** < -1

Dominican Republic (-2.89)

Myanmar (-2.61)

Namibia (-2.00)

Tanzania (-1.41)

Madagascar (-1.14)

Uzbekistan (-1.10)





# Are we entitled to parachute science and natural labs?

Parachute index =

In (pubs including local researchers /  
pubs not including local researchers)

Another example: sample sites and country affiliations for authors of publications in **igneous geochemistry database** ([www.earthchem.org](http://www.earthchem.org)) show similar **biases in sampling and publishing.**

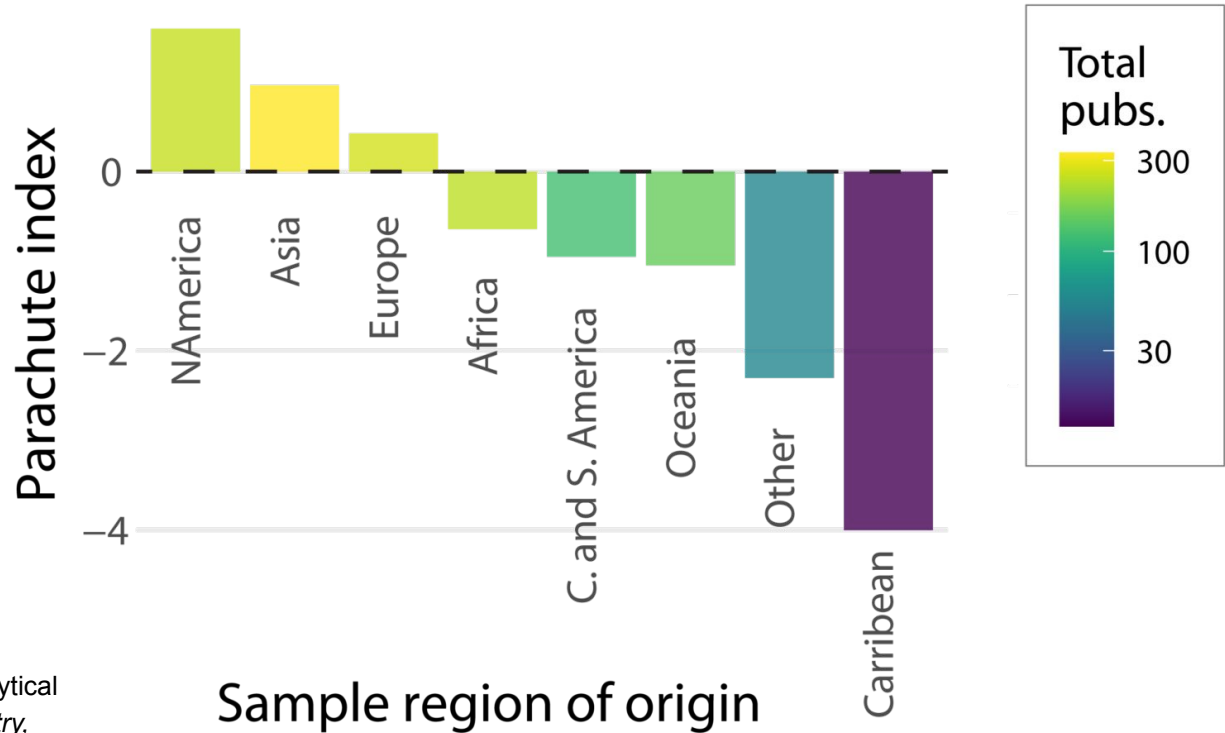
Carter, 2021, Exploring parachute science in analytical geoscience. (*EGU Blogs - Division of Geochemistry, Mineralogy, Petrology & Volcanology*)

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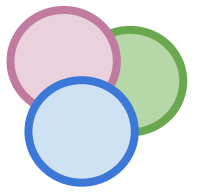
In the EarthChem database,

- more data from global north
- global south experiences a parachute index  $< 0$

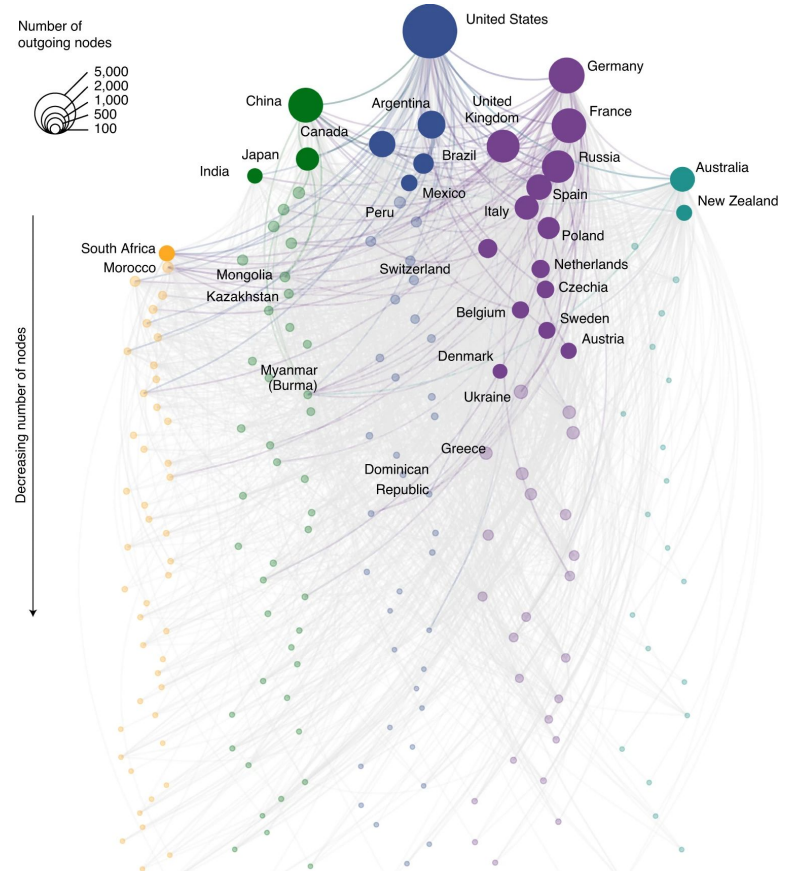


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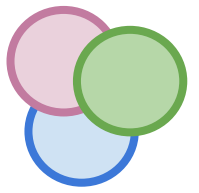


- Specimens and analytical equipment are not equally accessible for all
- Many geoscientists conduct research that is disconnected from local academics and communities
- **Let's prioritize community engagement and reciprocity in decisions for how and when we engage in field-based pedagogy.**



Nussaïbah B. Raja et alia, 2021, Colonial history and global economics distort our understanding of deep-time biodiversity. (*Nature Ecology and Evolution*)

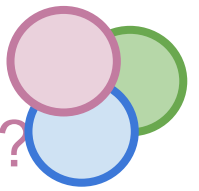
# Summary: How can we address barriers to field work for at-risk students and colleagues?



- **Let's prioritize access for at-risk students and colleagues in decisions for how and when we engage in field-based pedagogy.**

Amelia-Juliette Claire Demery and Monique Avery Pipkin, 2021, Safe fieldwork strategies for at-risk individuals, their supervisors and institutions. (*Nature Ecology and Evolution*) Illustration by Callie Rodgers Chappell.

# Summary: Does geology expertise need to be “out there”?



- **Let's prioritize many ways of knowing the earth in decisions for how and when we engage in field-based pedagogy.**

Jenne Schmidt, 2022, Crippling environmental education: rethinking disability, nature, and interdependent futures. *(Australian Journal of Environmental Education)*

Objectives



Universal Design for Learning

# Summary - radical questions about ethics of going into the field

- Let's interrogate our objectives in field-based pedagogy
- Prioritize access for at-risk students and colleagues
- Seek community engagement and reciprocity
- Expand our definition of geoscience expertise
- Be accountable

• **If we aren't addressing these barriers to and the context for field-based pedagogy, are we complicit in propagating bias in our discipline?**

Watermelon Tourmaline (and lepidolite). 2010  
JGW (Mount Mica Quarry, Paris, Maine)  
<https://www.mindat.org/photo-305154.html>



# An actionable anti-racism plan for geoscience organizations



**ACKNOWLEDGE RACISM AND INTERSECTIONALITY**

**BE TRANSPARENT AND ACCOUNTABLE**

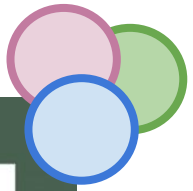
**REMOVE BARRIERS TO OPPORTUNITIES**

**EMBRACE AND ACCOMMODATE ALL MEMBERS**

**ADDRESS RACIST AND DISCRIMINATORY HISTORY**

**TACKLE COLONIAL AND PARACHUTE SCIENCE**

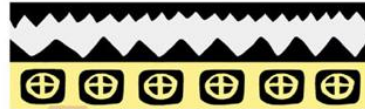
# Tackle colonial and parachute science?



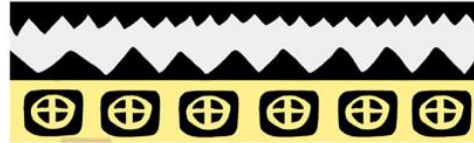
COME WITH AN EMPTY BASKET.



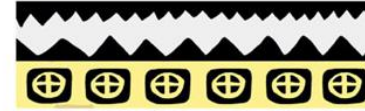
ACKNOWLEDGE FROM WHOM YOU ARE BORROWING KNOWLEDGE.



COMMUNICATE FINDINGS IN WAYS THAT EMPOWER LOCAL SOLUTIONS.



KNOWLEDGE OF THE OCEAN IS LIKE THE WAVES OF THE OCEAN.



PRACTICE RECIPROCITY.





# Are we entitled to parachute science and natural labs?



Yes?

*“... the **view of many geoscience academics is that** it is fundamentally necessary to study their specialty in a global context; that they will publish their results and/or train students for the benefit of humankind; there might be some, albeit often minor, connections with the universities and research institutions of the countries in which they practice their global studies and, therefore, that **there is a natural right of access to any part of the world’s geology**, with few restrictions.”*

(Ovadia and O’Connor, 2021)

David C. Ovadia and Eugene A. O’Connor, 2021,  
International geoscience cooperation - fair and equitable?  
(*Geological Society of London Special Publication 508*)

# Are we entitled to parachute science and natural labs?



No?

*“... **modern-day geoscience** is still pervaded by a research model (e.g. ‘parachute science’) that **exploits and extracts knowledge from remote locations**, with little to no credit for, or participation by the indigenous or local communities, thus limiting the science to a narrow band of questions and solutions dictated, and often published exclusively for, and by the white majority.”*

(Ali et alia, 2021)

Hendratta Ali et al. (20 authors!), 2021, An actionable anti-racism plan for geoscience organizations. (*Nature Communications*)