

Decolonizing Our Curriculum

- Disclaimer: I am not an expert. I care deeply about this topic, but I am still learning... the history, the language, the manifestations, the consequences, and the paths forward.
- Guidelines for Engagement
 - This a challenging, deeply personal, emotional, and important topic that has a long, brutal history
 - We must not shy away from the discomfort
 - We have to come to this topic with open, honest dialogue
 - We have to be willing to make mistakes and learn from them
 - We have to treat everyone with dignity and respect
 - We have to listen and truly hear

Dr. Kelton McMahan

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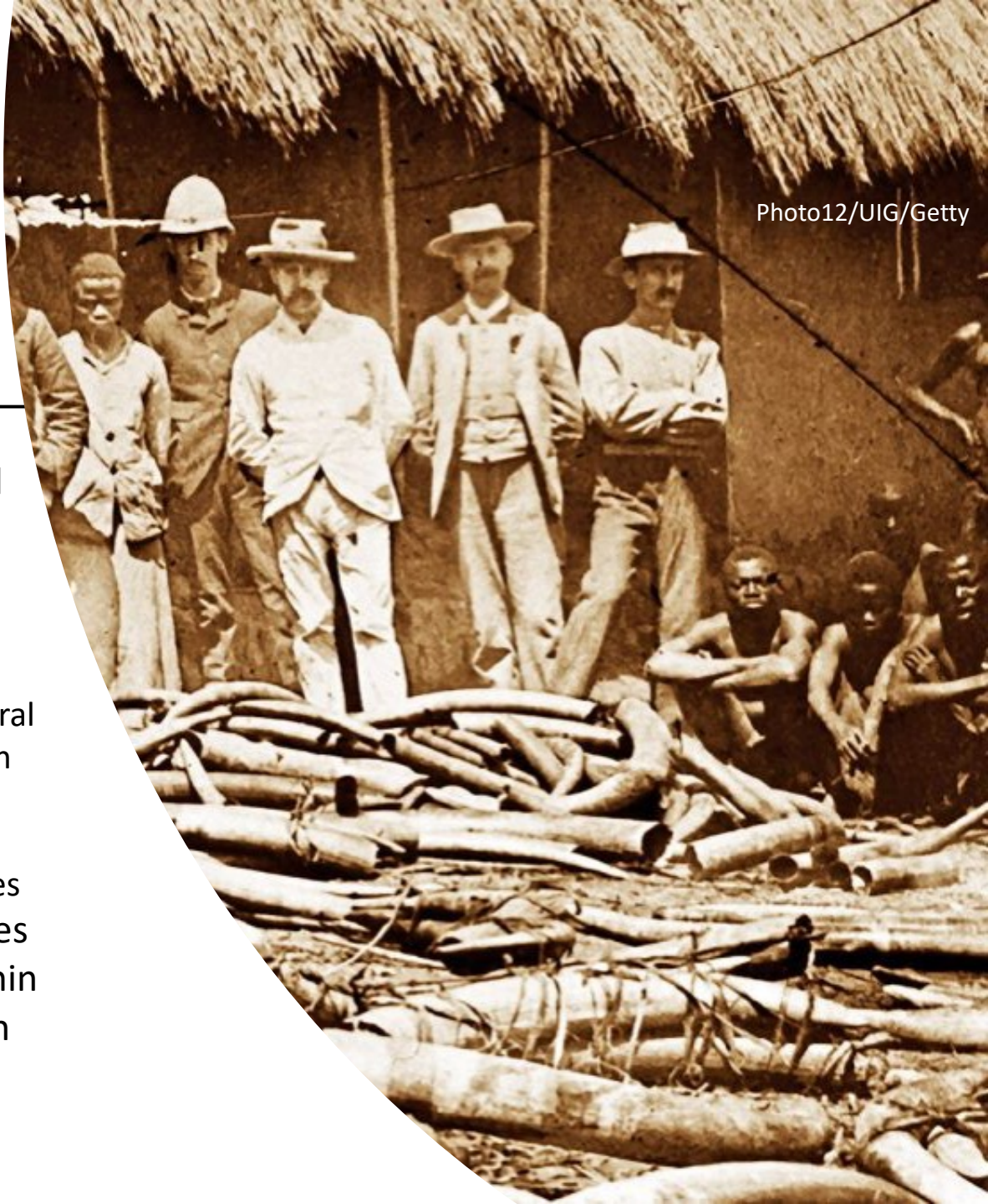
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Colonialism is often defined as a system of government, which seeks to defend an unequal system of commodity exchange, a practice of domination, which involves the subjugation of one people to another – Corbridge (1993).

Photo12/UIG/Getty



- Decolonization requires individual learning and self-reflection to identify coloniality in systems of beliefs and values.
 - E.g., Holding Western and/or Eurocentric behavioral and cultural norms as superior, objectification of the natural world and compartmentalization of human identities into context-based roles
- Much as structural racism produces unconscious racial bias, living within colonial systems of value results in unconscious coloniality.

A Legacy of Systemic Racism Persists

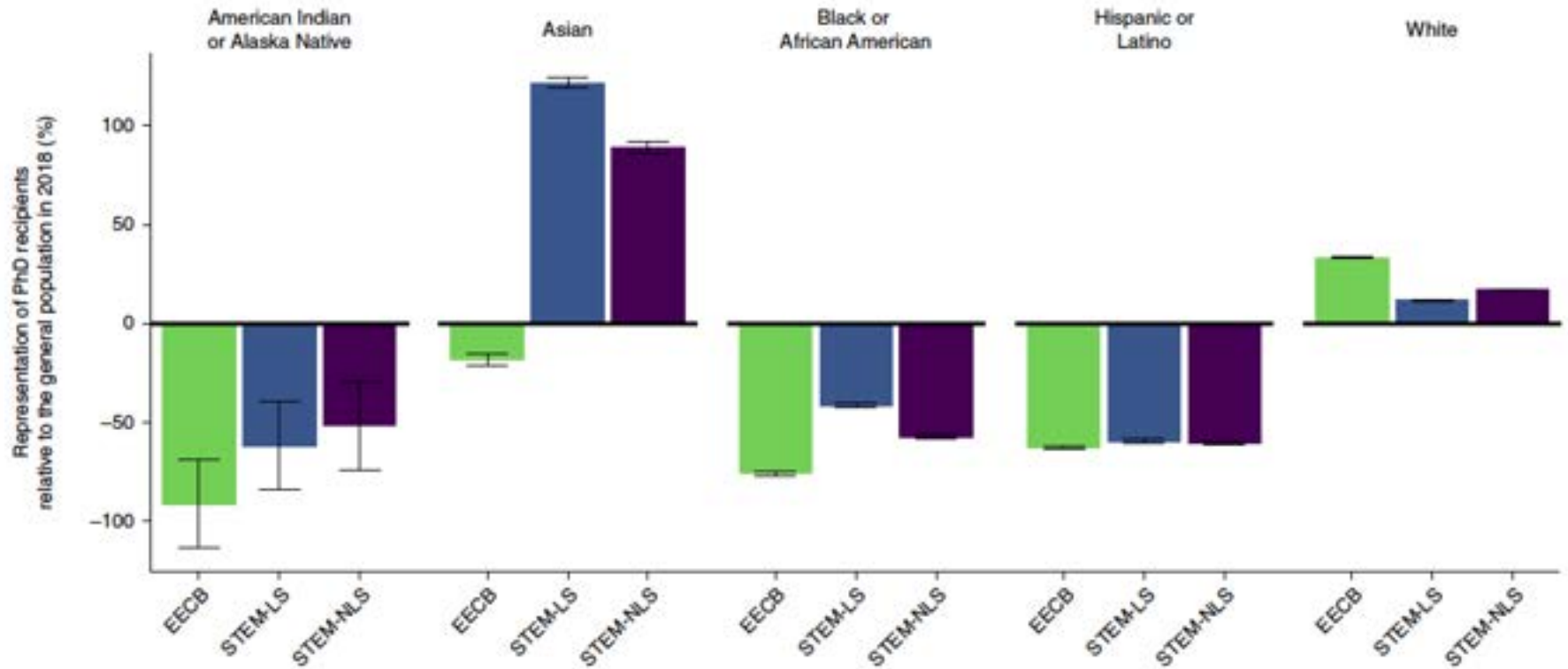


Fig. 1 | Representation of BIPOC among students in EECB, other life science fields and non-life science STEM fields in the United States. Bar graph of the representation of people of different ethnicities among students of EECB ($n=1,661$), STEM-LS ($n=7,473$; includes all five fields under the National Science Foundation (NSF) subfield of life sciences that we did not categorize as EECB) or STEM-NLS ($n=16,339$; includes all other (non-life science) STEM fields, as defined by the NSF Survey of Earned Doctorates¹⁵⁹). The percentage of PhD recipients of each racial or ethnic group¹⁶⁰ was subtracted from the estimated percentage of each group in the United States then divided by the percentage of each race or ethnicity in the United States (American Indian or Alaska Native = 0.7%; Asian = 5.6%; Black or African American = 12.3%; Hispanic or Latino = 18.3%; white = 60.2%)¹⁶⁰. Positive values indicate over-representation and negative values indicate under-representation relative to the US population. The racial categories in this figure are those used by the NSF and US Census Bureau and differ slightly from those used elsewhere in this paper (for example, Hispanic or Latino instead of Latin). The error bars represent 99% confidence intervals from the US Census Bureau. The data from the NSF were from a complete census and contained no sampling error. See the Supplementary Information for more details on data collection.

Decolonizing Curricula


- Active acknowledgement: case studies and highlights
- Full Modules within courses
- Full courses

MAF 500: Race, Gender, Colonialism and Science

SEM: (3 crs.) Applies social science tools to the study of the practice of science (including ecology and marine science) as cultural phenomena. (Seminar) Pre: graduate standing.

SOC 428: Institutional Racism

SEM: (3 crs.) Cross-listed as (SOC), AAF 428. Critically examines the origin, nature, and consequences of institutional racism in the US. (Seminar) Pre: one 300-level sociology course or permission of instructor.



Active acknowledgement:
Case studies and highlights
within course material



BES550: Advanced
Ecology
Food Web Ecology

Elton - 1927: *Animal Ecology*

- “Food chains” and “food cycles”

Abū ‘Uthman ‘Amr ibn Baḥr al-Kinānī al-Baṣrī

(أبو عثمان عمرو بن بحر الكناني البصري), (AKA Al-Jāḥiẓ)

“Mosquitos know instinctively that blood is the thing which makes them live” and when they see an animal, “they know that the skin has been fashioned to serve them as food”. In turn, flies hunt the mosquito “which is the food that they like best”, and predators eat the flies. “All animals, in short, can not exist without food, neither can the hunting animal escape being hunted in his turn. Every weak animal devours those weaker than itself. Strong animals cannot escape being devoured by other animals stronger than they. And in this respect, men do not differ from animals, some with respect to others, although they do not arrive at the same extremes. In short, God has disposed some human beings as a cause of life for others, and likewise, he has disposed the latter as a cause of the death of the former” *via Zirkle (1941) Proc Am Phil Soc*



9th century

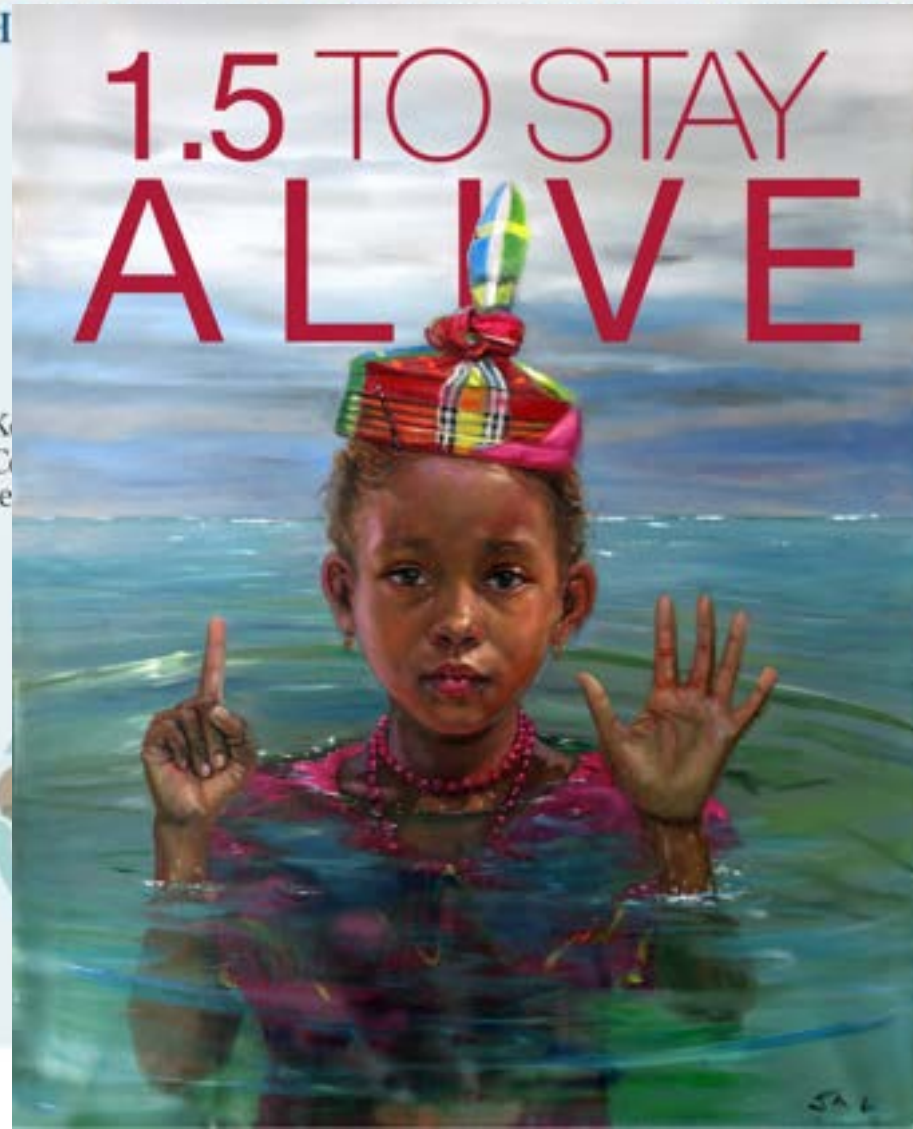




OCG106G: You, Me, and Life in the Sea: Climate Adaptation and Mitigation

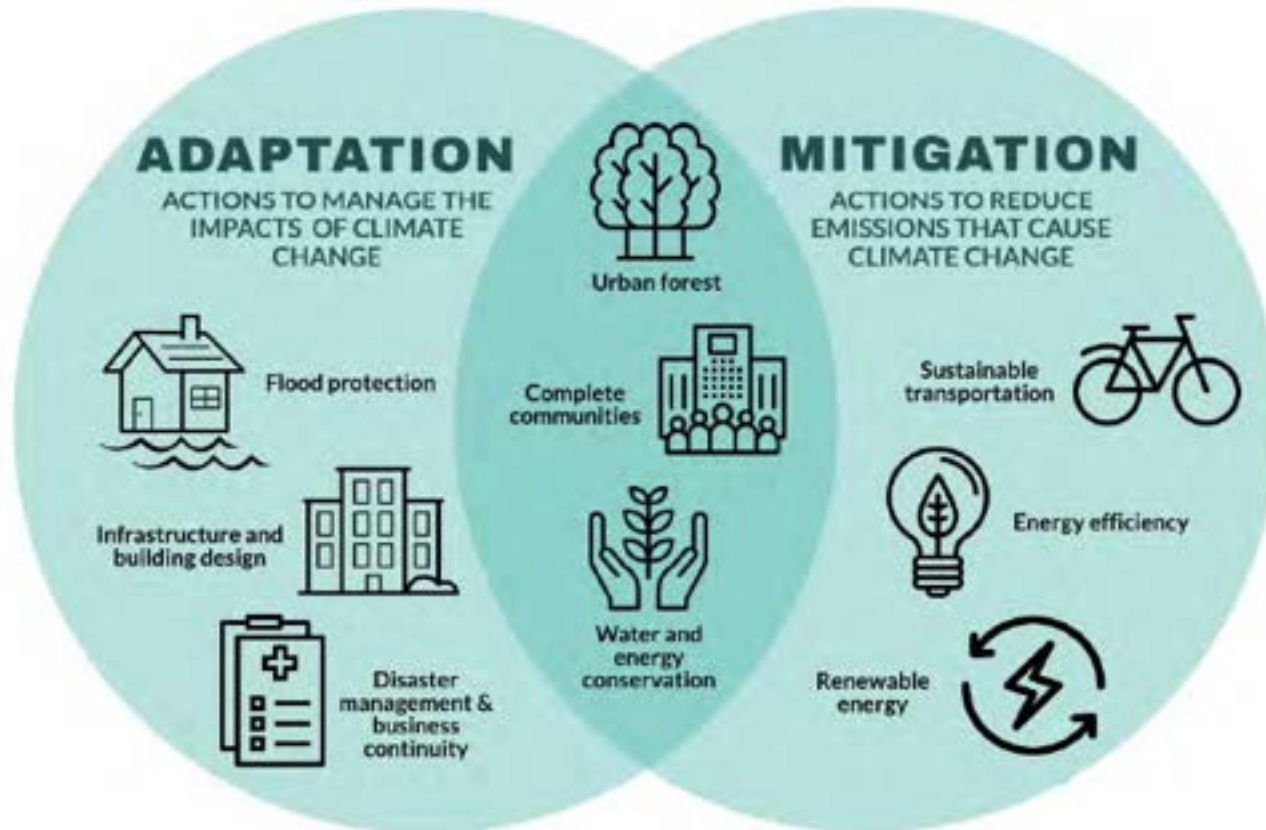
Paris Climate Agreement

“Reduce CO₂ emissions to keep warming below 2°C”



Environmental Justice

- Some groups—socially and economically disadvantaged ones—face the greatest risks, because of where they live, their health, income, language barriers, and limited access to resources.
- As time goes on, they will suffer the worst impacts of climate change, unless we recognize that fighting climate change and environmental justice are inextricably linked.



OCG106G: You, Me, and Life in the Sea:

Marine Natural Products

From Sea to Pharmacy



Biopiracy:

The use of indigenous knowledge and resources by third parties for profit without permission/informed consent from or adequate compensation, or recognition to the owners of those resources and knowledge.



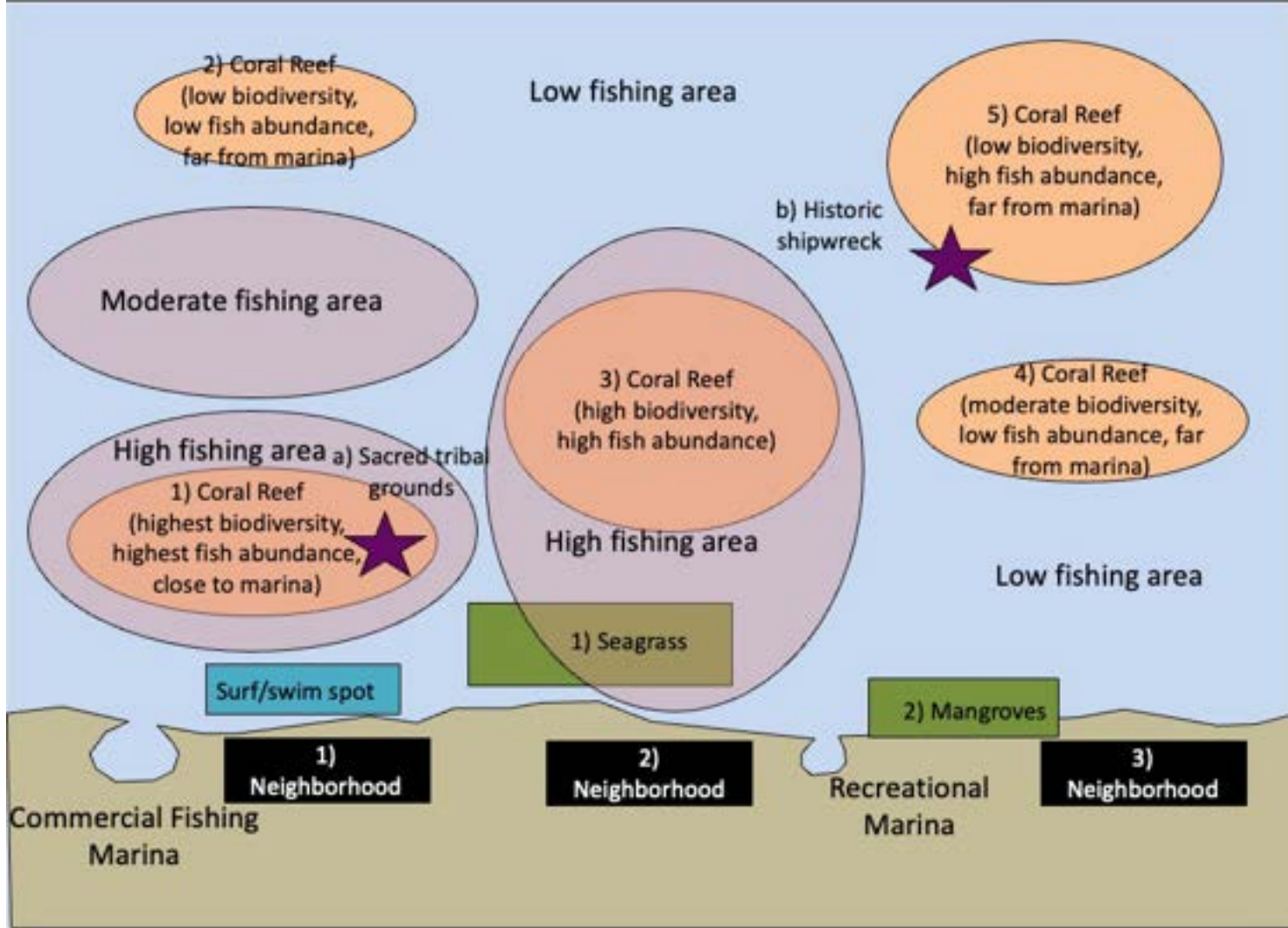
Biopiracy row at UN talks in Geneva threatens global deal to save nature

<https://www.theguardian.com/environment/2022/mar/30/cop15-faces-copenhagen-moment-genetic-data-dispute-aoe>

More talks needed on targets to protect wildlife as developing countries call for payment for finds based on their biodiversity



📷 The Geneva biodiversity conference in Switzerland, where the use of digital sequence information emerged as a key point of difference between the parties. Photograph: IISD/ENB

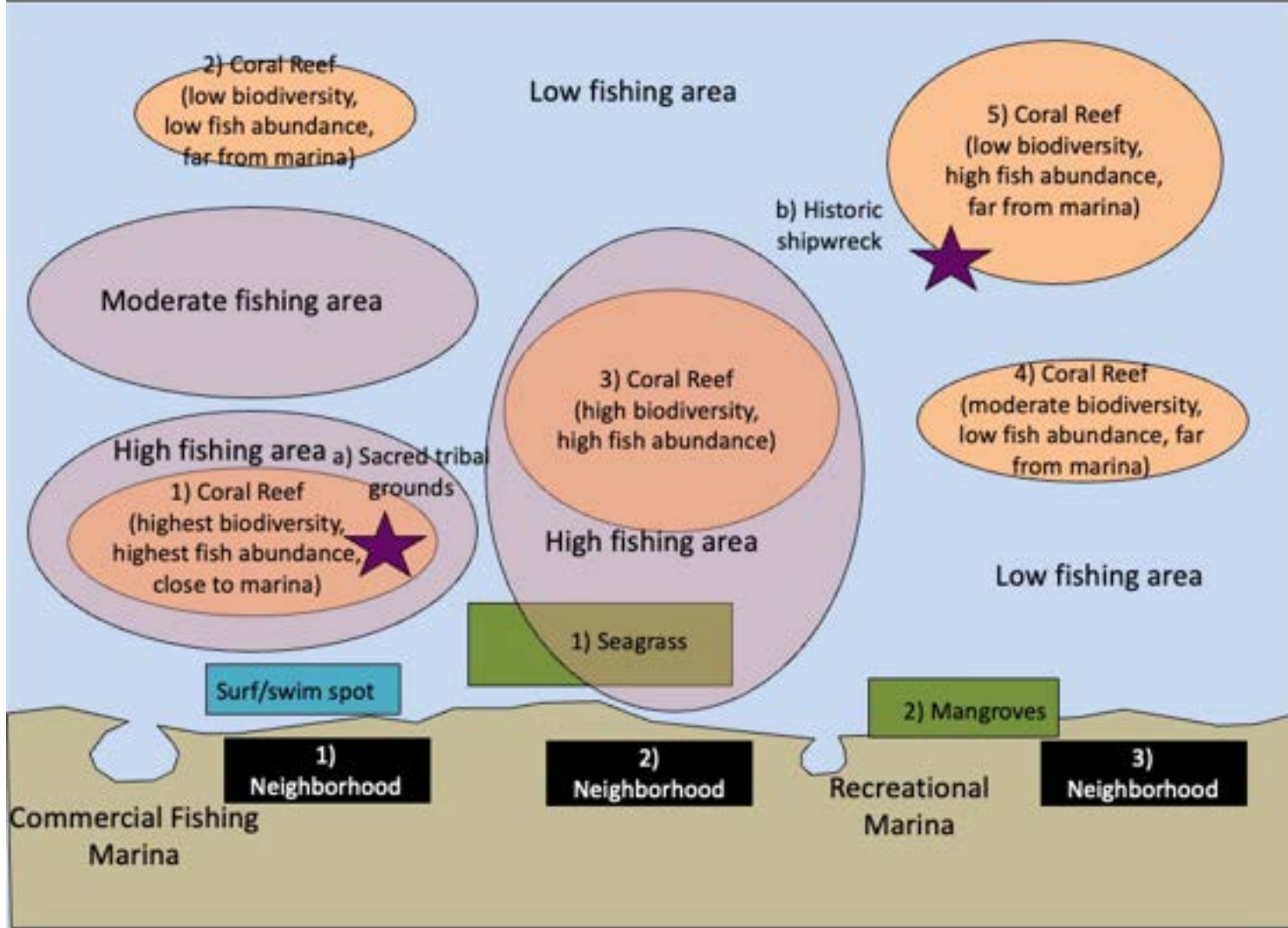


Activity Goals: To enhance your understanding of marine protected areas (MPAs) as a conservation tool for ecosystem-based management.

Part I: You will design an MPA and justify its purpose, rules, and location.

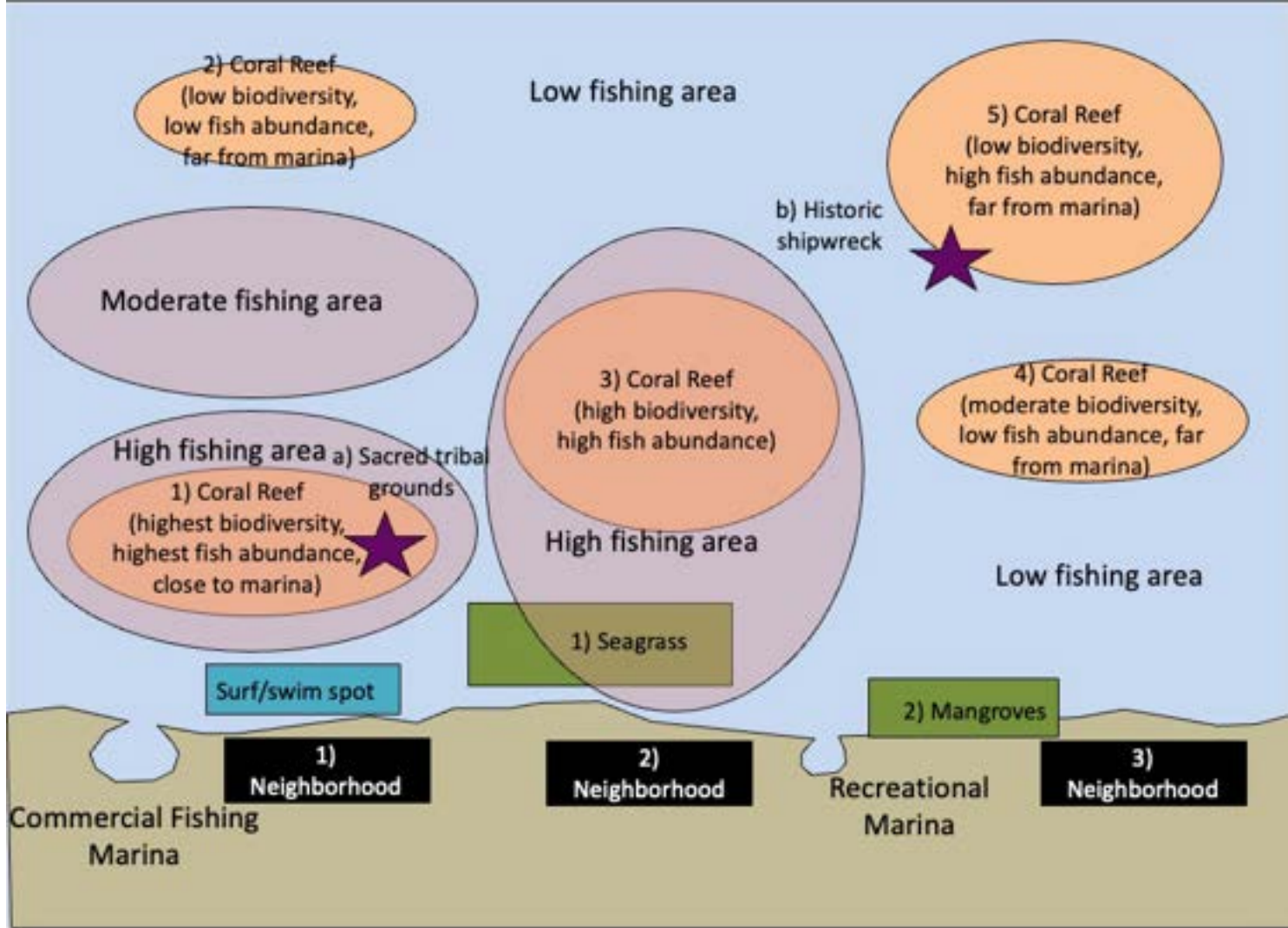
Part II: You will draw your MPA on a hypothetical coastline.

Part III: You will reflect on the tradeoffs of your MPA design.



Part I: Designing your MPA

Analyze a hypothetical coastline to determine the best place to establish one or multiple Marine Protected Areas. Before you begin drawing, spend some time thinking about: 1) why you are establishing your MPA in regard to the three pillars for marine conservation: natural heritage, cultural heritage, and sustainable harvest, 2) where are the critical locations relative to your desired goals (e.g., what kind of things are you trying to protect?), 3) Do you need to protect more than one type of place to achieve your desired goals? 4) Are there competing interests in certain areas that need to be managed together?



Part III: Trade offs in designing marine protected areas

Reflect on the tradeoffs you had to make when designing an effective MPA(s). No action is without consequences and protecting one thing often means impacting something else. Think about the systems, jobs, people, groups, environments, etc. that might be impacted by the proposed MPA, its location, and rules.

OCG550: Environmental Isotope Geochemistry

The Peer Review Process





Diversifying the Reviewer Pool

After a successful trial to actively encourage authors to recommend diverse lists of reviewers for their papers, a reminder statement about diversity will now be rolled out across AGU journals.

AGU is explicitly encouraging a more balanced pool of reviewers for journal manuscripts in terms of gender, age cohort, ethnicity, and country of origin. Credit: [Mediamodifier/38 images, CC0 1.0 Universal](#)

By Brooks Hanson and Jory Lerback © 4 October 2017



Increasing Diversity in the STEM Workforce by Reducing the Impact of Bias: Summary of Agency Final Report

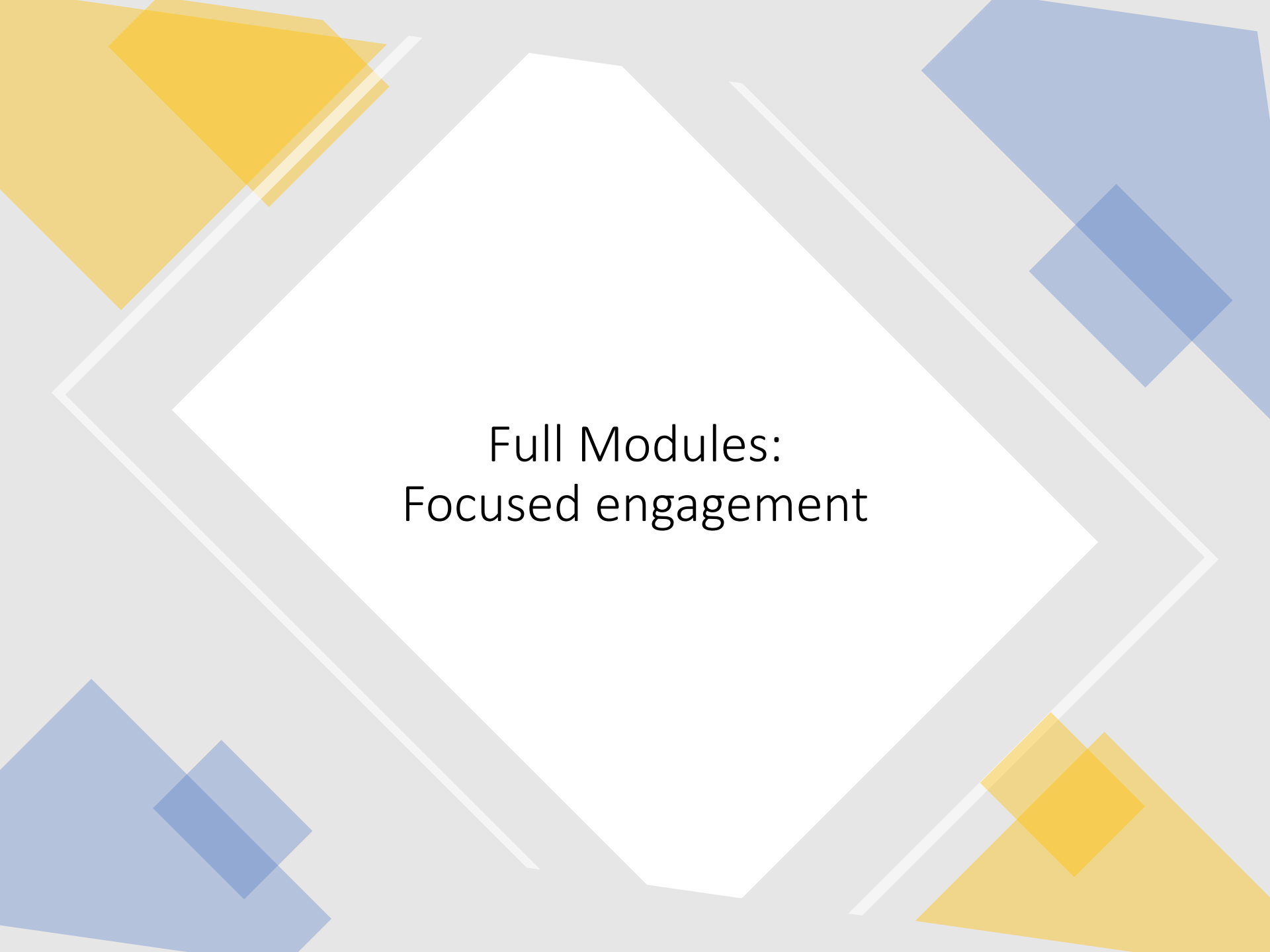
National Science Foundation (NSF)

[Click here](#) for an inventory of NSF's current and planned efforts to increase diversity and reduce the impact of bias in the workplace, during merit review, and in academic institutions. This was developed as part of a report from OSTP and OPM entitled *Mitigating the Impact of Bias in the STEM Workforce: Strengthening Excellence and Innovation*.

[Reducing the Impact of Bias in the STEM Workforce: Strengthening Excellence and Innovation \(Full Report\)](#)

[Reducing the Impact of Bias in the STEM Workforce: Strengthening Excellence and Innovation \(Digest\)](#)

https://www.nsf.gov/od/broadeningparticipation/nsf_reducing_bias_summary_agency_final_report_160616.pdf



Full Modules:
Focused engagement

Building explicit modules in courses:

BES550: Advanced Ecology

Class Week	Date	day	Activity	Instructor	Seminar Leader 1	Seminar leader 2	Assignments due
1	8 Sep	Th	Introduction to class	All three			
1	13 Sep	Tu	Discussion: Approaches to research	All three	Instructors		
2	15 Sep	Th	Lecture: Decolonizing Ecology	KWM			
2	20 Sep	Tu	Discussion: Parachute science, anti-oppression	KWM	Kelton		
3	22 Sep	Th	Lecture: Metabolism & energetics	SM			
3	27 Sep	Tu	Discussion: Allometry & statistics	SM	Scott		Problem set
4	29 Sep	Th	Lecture: Too hot (or cold) to handle: thermoregulation	SM			
4	4 Oct	Tu	Discussion: Thermal ecology	SM	Ashley		
5	6 Oct	Th	Lecture: Make some more: growth and reproduction	SM			
5	11 Oct	Tu	Discussion: Reproductive energetics	SM	Megan G	Gabby K	
6	13 Oct	Th	Lecture: Nutritional ecology: foraging and digestion	SM			
6	18 Oct	Tu	Discussion: Nutritional ecology	SM	Meghan C	TK	Position paper
7	20 Oct	Th	Lecture: Food webs and energy transfer	KWM			
7	25 Oct	Tu	Discussion: Trophic cascades and functional redundancy	KWM	Brooke		
8	27 Oct	Th	Lecture: Ecological Niche	KWM			
8	1 Nov	Tu	Discussion: Functional Redundancy	KWM	Annafaith	Maddie	
9	3 Nov	Th	Breaking through Colonized Ecology - Presentations	KWM	Presentations		Synthesis paper
-	8 Nov	Tu	Election Day (NO CLASS)				
9	10 Nov	Th	Breaking through Colonized Ecology - Presentations	KWM	Presentations		
10	15 Nov	Tu	Lecture: The ecology of invasions	GF			
10	17 Nov	Th	Discussion: do native predators provide biotic resistance to invasive lionfish?	GF	Mike	Caroline	critique 1
11	22 Nov	Tu	Lecture: adaptive responses	GF			
-	24 Nov	Th	Thanksgiving (NO CLASS)				
11	29 Nov	Tu	Discussion: do marine snails adapt to predation?	GF	Marissa	Chantal	critique 2
12	1 Dec	Th	Lecture: ocean acidification	GF			
12	6 Dec	Tu	Discussion: are larval fish compromised by ocean acidification	GF	Paola		critique 3
13	8 Dec	Th	Lecture: meta-analysis and synthesis	GF			
13	13 Dec	Tu	Discussion: is climate change shifting species distributions?	GF	Katie	Rebecca	critique 4

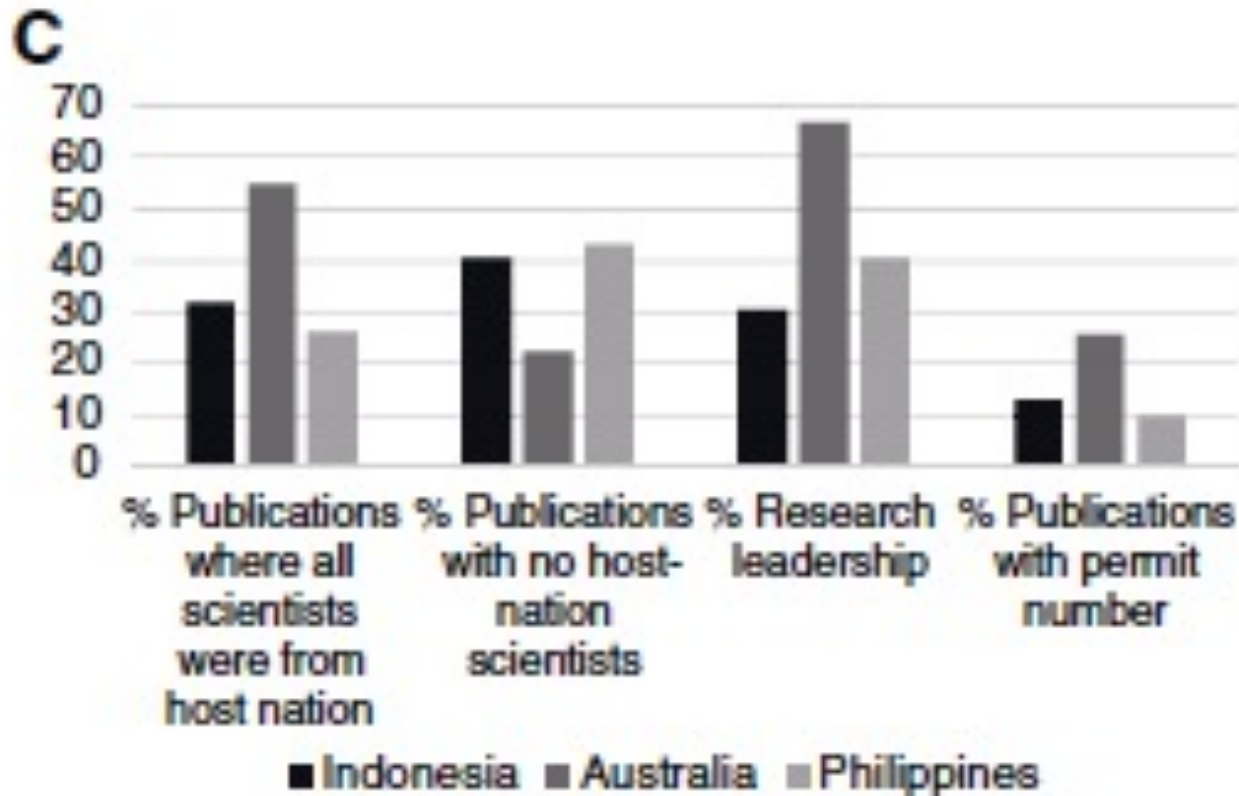


Parachute Science

AKA Colonial or Parasitic Science

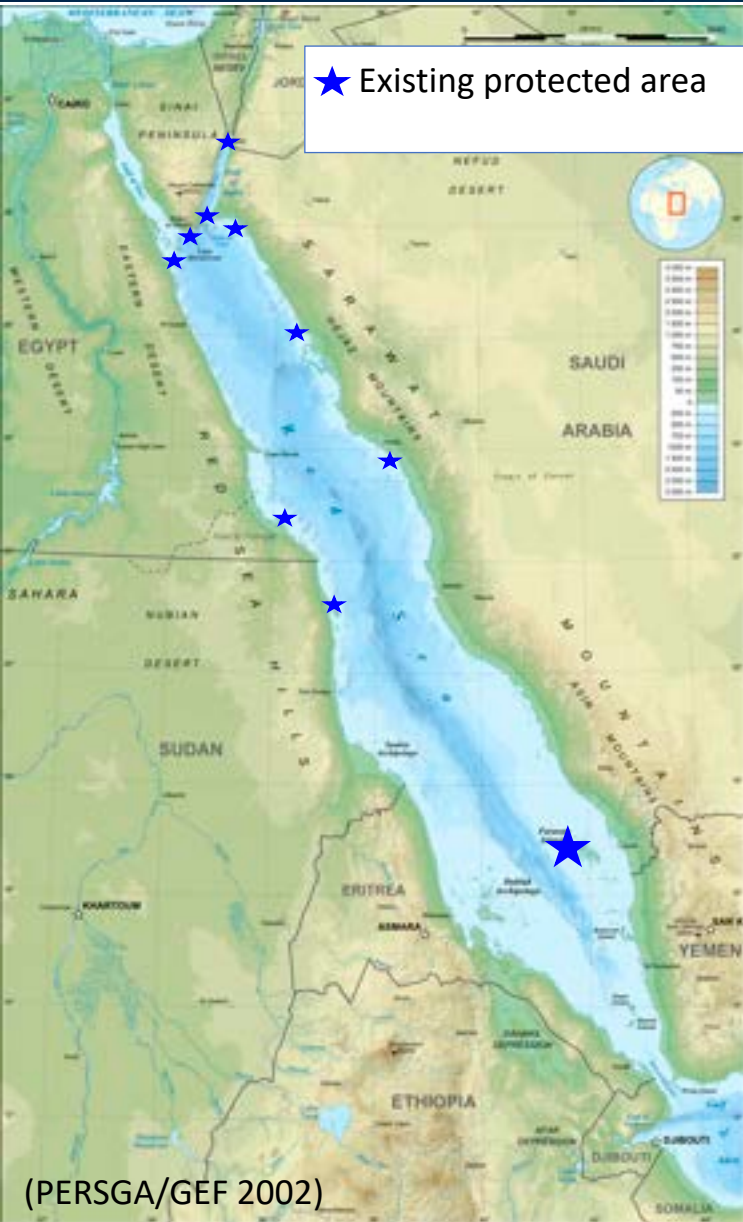
- Creates dependency on external expertise
- Often does not address local research needs
- Can hinder local research efforts
- Impairs scientific progress through decontextualization and lost knowledge

- Global analysis of scholarly articles (1969–2020) focusing on tropical and subtropical coral reef biodiversity

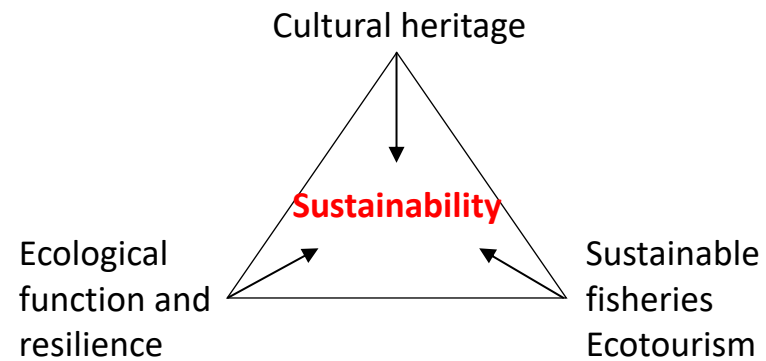


- ~40% of publications with fieldwork conducted in Indonesia or Philippines had no 'host nation' scientist included, whereas Australia was only 20%.
- Similarly, 'research leadership' was higher in Australia (~66%) compared to Indonesia (~30%) and the Philippines (~40%).

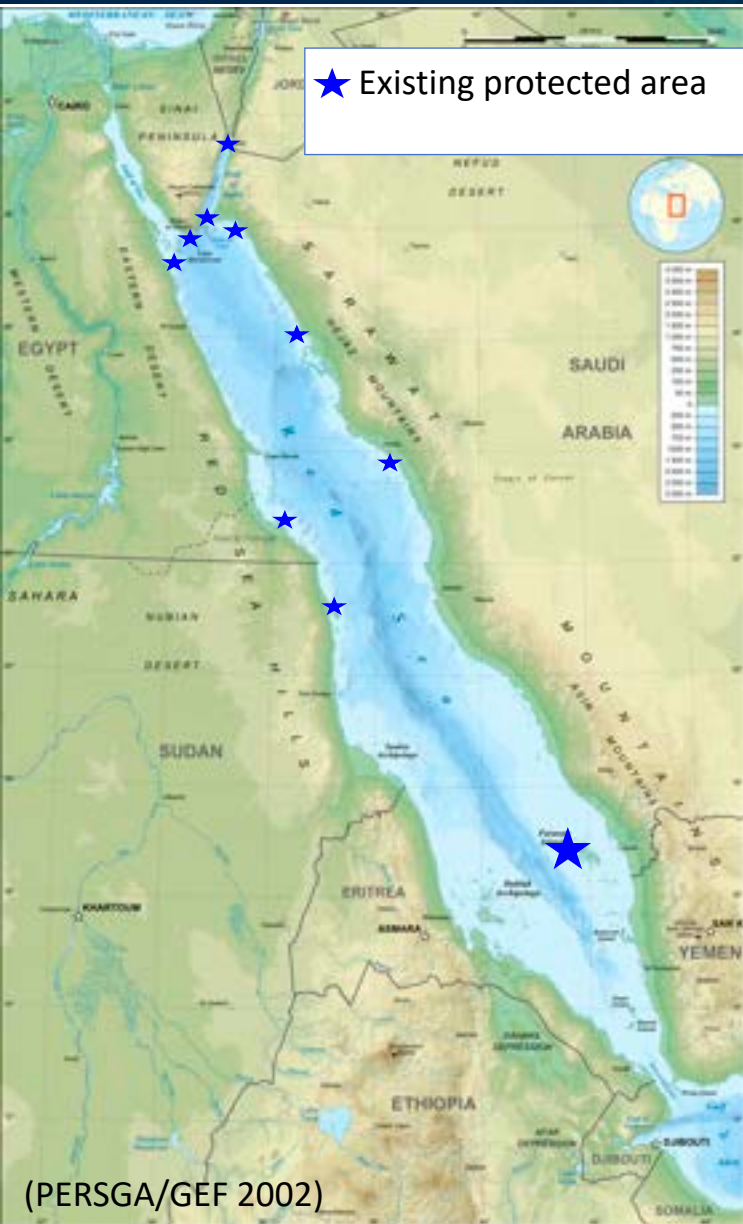
Where it started...



- Saudi Arabia MPAs (30% coastline?):



Incorporating local ecological knowledge



Fisherman



Boat owners



Retailers



Carbon isotope fractionation of amino acids in fish muscle reflects biosynthesis and isotopic routing from dietary protein

Kelton W. McMahon^{1*}, Marilyn L. Fogel², Travis S. Elsdon³ and Simon R. Thorrold⁴

¹Massachusetts Institute of Technology and Woods Hole Oceanographic Institution, Joint Program in Oceanography and Ocean Engineering, Woods Hole Oceanographic Institution, Woods Hole, MA 02543, USA; ²Carnegie Institution of Washington, 5251 Broad Branch Rd. N.W., Washington, DC 20015, USA; ³Southern Seas Ecology Laboratories, School of Earth and Environmental Sciences, University of Adelaide, Adelaide, SA 5005, Australia; and ⁴Biology Department, Woods Hole Oceanographic Institution, Woods Hole, MA 02543, USA

Coral Reefs (2011) 30:1135–1145

DOI 10.1007/s00338-011-0816-5



REPORT

Carbon isotopes in otolith amino acids identify residency of juvenile snapper (Family: Lutjanidae) in coastal nurseries

K. W. McMahon · M. L. Berumen ·
I. Mateo · T. S. Elsdon · S. R. Thorrold

A new method to reconstruct fish diet and movement patterns from $\delta^{13}\text{C}$ values in otolith amino acids

Kelton W. McMahon, Marilyn L. Fogel, Beverly J. Johnson, Leah A. Houghton, and Simon R. Thorrold



Can. J. Fish. Aquat. Sci. 68: 1330–1340 (2011)

doi:10.1139/F2011-070

Published by NRC Research Press

Linking habitat mosaics and connectivity in a coral reef seascape

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15372–15376 | PNAS | September 18, 2012 | vol. 109 | no. 38

www.pnas.org/cgi/doi/10.1073/pnas.1206378109



Where I'm going...



Nexus between traditional practice, western science, and novel technologies:
Incorporating multiple knowledge systems into conservation solutions



One People One Reef

Hofagie Laam le

www.onepeopleonereef.org

Our Team



John Bulmal Jr.
Program Co-Leader & Community Organizer
One People One Reef – Board Member



Nicole Crane MSc, MAB
Program Co-Leader & Marine Biologist
One People One Reef – Board Member



Dr. Michelle Padrick
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Dr. Brannen Williams
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Emma Leaster
Education, Outreach & Fundraising Coordinator



Kirby Doyle
Video Journalist



Sarah Hayes
Program Coordinator



Justina Paly
Youth Project Coordinator



Alex Seo
Local Scientist & Data Collector
Lives on the Island of Falalap in the USTP Atoll



Basco Merle
Local Scientist & Data Collector
Lives on the Island of Asoo in the USTP Atoll



Mike Tasepeli
Youth Representative
Lives on the Island of Falalap in the USTP Atoll



Darcy Tagamal
Youth Representative
Lives on the Island of Mlag-Mlag in the USTP Atoll



Maria Dehmal
Local Scientist & Data Collector
Lives on the Island of Mlag-Mlag in the USTP Atoll



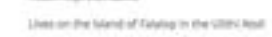
Albert "Data King"
Lives on the Island of Falalap in the USTP Atoll



Dr. Giacomo Bernardi
Fish Biologist – Ecological Connectivity



Dr. Supri Wongboonsakul
Conservation Social Scientist



Synthesis Paper and Presentation

Synthesis Paper due Nov 3rd:

Work in pairs to identify a prominent ecological scientist from a historically minoritized group in STEM and write a report (approx. 2-3 pages or 1,000-1,500 words), highlighting:

- 1) Their career path and contributions to ecology (~1 page)
 - a. Brief description of their education and training, positions held, etc
 - b. Descriptions of key research programs, important contributions to ecological theory, additional work that built off their research etc.
- 2) The socio-political challenges during their career (~1-2 pages)
 - a. Describe which historically minoritized community(ies) they are (were) a part of
 - b. Discuss the challenges they did face (i.e., documented examples) or could likely face as members of those communities during their career. For this component, you'll need to do some research into the socio-political state during your ecologist's career and how explicit and implicit bias and systemic or institutional barriers could affect their career development, contribution to science, personal growth and safety.

In Class Presentations, Nov 3rd and 10th:

Each group highlights their synthesis paper (1a, and 2a,b) with the class in an ~5 min presentation on Nov 3rd with time for discussion on Nov 10th.

Historically minoritized groups in STEM: NSF generally defines historically “underrepresented” groups as women, persons with disabilities, and racial and ethnic groups—blacks, Hispanics, and American Indians, Alaska Natives, and Pacific Islanders. This is certainly not all encompassing, as scientists have been minoritized based on their sexual orientation, gender identity, and socioeconomic status as well.

From Charles H. Turner to comparative cognition: 1850–2020

Charles H. Turner made important observations about animal cognition, which went against the leading paradigms of the time. His ideas have stood the test of history, but Turner's work has largely been forgotten, likely because his ethnicity prevented him from becoming a research team leader and so he could not train scientists who might have continued his approach. Turner was active in the U.S. civil rights movement and advocated that education is key to overcoming ethnic barriers in society.



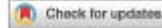
Nikolaas Tinbergen



- Charles Turner (1867-1923) established a research program (>70 pubs) on individual variation in behavior and learning competences, intelligent problem solving that was in sharp contrast to the prevailing ideas on animal as only credited with simple learning abilities
- Nikolaas Tinbergen received a Nobel prize for his studies on individual and social behavior in animals. Turner had already published those same findings in 1908.

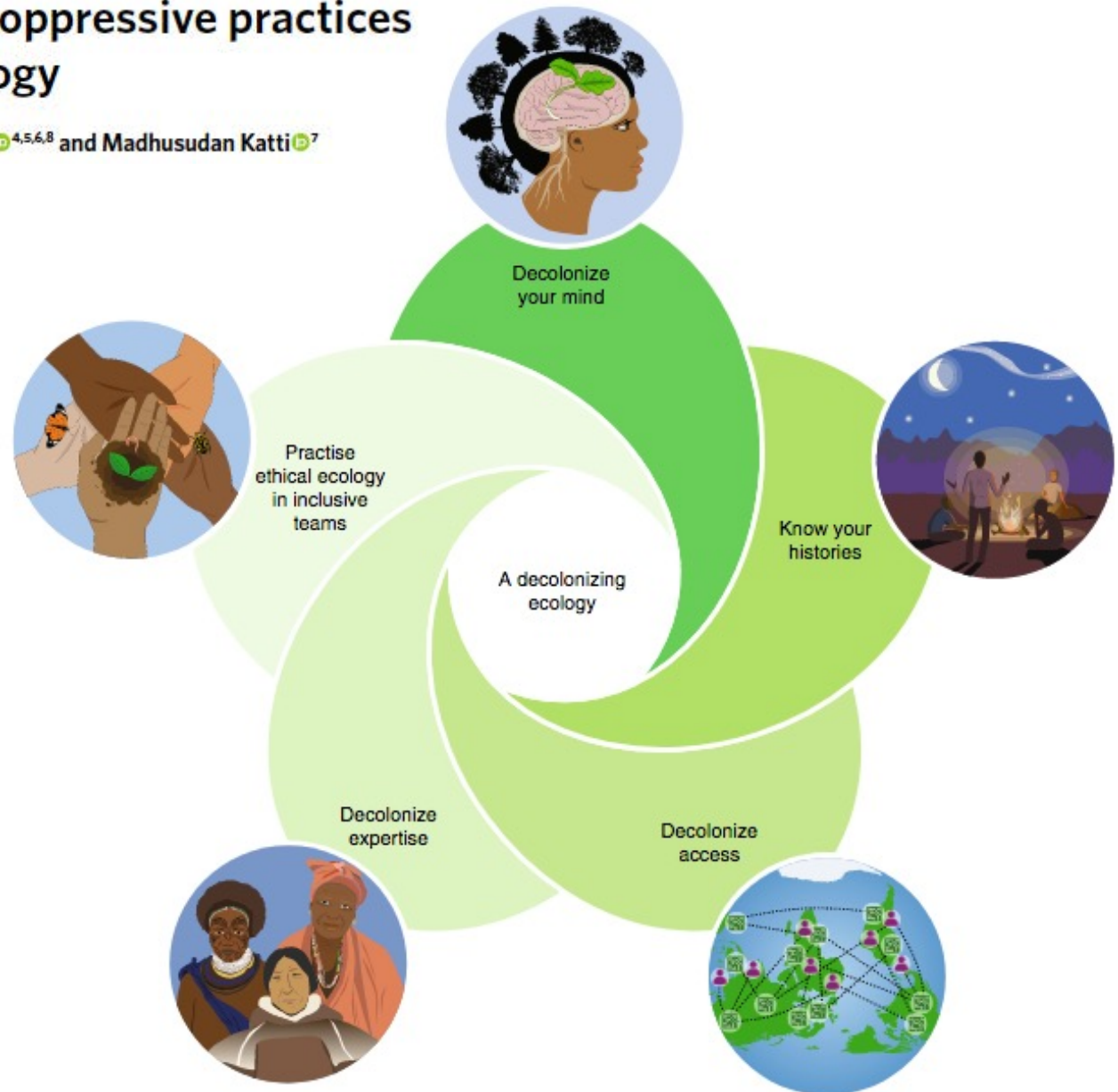


- Why is Turner not better known and accredited?
 - No opportunity to mentor/train future scientists. By comparison Ivan Pavlov, a contemporary, trained over 140 students.
 - Taught high school summer school for African American children in St. Louis during East St Louis Massacre of 1917 where 100 African Americans were murdered and over 6,000 homes were burned to the ground.



Decoloniality and anti-oppressive practices for a more ethical ecology

Christopher H. Trisos^{1,2,3,8}✉, Jess Auerbach^{4,5,6,8} and Madhusudan Katti⁷



Student Feedback

BES 550 (0001): Advanced Ecology

Fall 2021 | Kelton McMahon | Course CIP Code: 03.0103

- Kelton is an exceptional teacher. His lectures and discussions were engaging and thought-provoking. Not only did Kelton cover a series of interesting ecological topics, but dedicated proportion of his course section to discussing, reading/writing about decoloniality in ecology, which is something that is NEVER included in formal courses. I think this material should be integrated into STEM related courses at URI whenever possible.
- Kelton's portion of the course was the perfect closing to advanced ecology. To include ethics, morals, social issues in ecology has changed my perception on how science should be conducted. I'm fortunate enough to learn about progressive and conscientious science early in my career.
- Great job with teaching us a new topic that is not typical to come by in this held. We could really tell you were authentic and tried your absolute best. I enjoyed it! Thank you!
- I really enjoyed the discussions about decolonizing ecology and choosing a non-contemporary scientist to write about for the synthesis paper. I think this was a great way to apply real world problems to class material and help progress the field of ecology. I also like how you introduced the topic at the beginning of your section then moved in other ecological topics and then circled back to decolonizing ecology at the end. This gave us the opportunity to think about decolonizing ecology in the context of the papers and other discussions we had in addition to the ones specifically aimed at decolonizing ecology.

Community Discussion

