Suggestions to Improve the Semester In Environmental Science at the MBL

By SES students, for SES students

To our scientific community,

SES students are deeply saddened by the recent acts of racial injustice and police brutality inflicted upon members of the Black community at all levels. We recognize that silence is complacency, and that we must hold ourselves accountable and place ourselves in active roles to fight racial injustice within all the communities we are a part of, including our STEM communities. The community of professionals working in STEM fields, including that of biology, is grossly lacking in racial and other dimensions of diversity. As an academic field, the scientific community has often attempted to appear as if it operates in a space that is separate from the human communities it affects. However, the histories of these disciplines have long been intertwined with racist practices that ignore environmental racism, violence against indigenous communities, and non consensual medical experiments conducted on vulnerable BIPOC communities, to name a few. As students working to understand our built and natural environments, we recognize that we must hold ourselves accountable to doing so through a framework of active anti-racism.

Though many organizations have recently released solidarity statements, these events are not new, but are the latest in a 528-year history of racial violence on this continent. Along with our country's long history of anti-Black brutality and racism plaguing our communities, the COVID-19 pandemic has killed hundreds of thousands in two months, all while causing disproportionate suffering in communities of color.
We commit ourselves to expanding our network of diverse scientists so that we may support each other and hold ourselves accountable as we practice anti-racism and inclusivity. As SES students, we look forward to engaging actively with faculty and speakers at the MBL regarding ways in which we can diversify both our student body and the faculty from which we learn.

In solidarity and hope,

SES students:

Maryann Tekverk

Hannah Kuhns

Jordan Stark

Madeline E. Gorchels

Samuel N Bogan

David Tian
Erica Moretti
Nia Bartolucci
Olivia Box
Emily Stone
Rachel W Clifford
Xiaoxuan Yang
Nicholas Patel
Charlotte Hovland
Augusta Hollers
Emily DeFelippis
Sarah Pope
Lauren Hamm
Melissa Taing
Ali McGarigal
Briana Moore
Lauren Skinnion
Khashiff Miranda
Kathryn Hulleman
Cody Pham
Grant McKnight
Olivia Blasdel
Miriam Ritchie
Olivia Shao
Grayson Walter
Lauren Johnson
Marguerite Tate
Collin Knauss
Emma Hauser
Jessie Moravek
Kyra Madunich

Foreword

This document is an outcome of the last year's worth of conversations within the 2019 SES cohort. These conversations seek to question our role as scientists in the modern world and force us to acknowledge systemic issues in the ways science has previously played out with the hope of our generation of scientists having a more rounded and more valuable impact on society in the face of environmental degradation and climate change. We extended these conversations to SES alumni dating back to 2008 and found voices echoed within their cohort circles. A common thread through all these voices, however, was a tone of immense appreciation for the learnings we received in the little village of Woods Hole and their desire to reach out and help the SES Program in whatever way we can. This document takes a direct approach at the problems we have experienced through the course of this program, not with the intention of simply pointing fingers, rather to seek to innovate, modernize and make the 4 months that were so precious to us more appealing to a more diverse and rapidly changing student base. We alumni plan on being by your side through the process of change.

The last few months have forced a lot of us to reconsider the actions we've previously taken and take responsibility for being better. We hope you read this with an open mind and join us. We hope that this will be a start.

Increasing diversity of speakers at the MBL

SES Distinguished Scientist Seminar Series

Every year, the MBL hosts the SES Distinguished Scientist Seminar Series, which gives SES students and the MBL community the chance to learn from scientists working at the top of their fields. As students, we would love to meet with scientists that better represent the diversity of the environmental field we are striving for, and who place a strong emphasis on the social issues tied to their ecological work. The University of Michigan is one example of an institution that has recognized the need to create a network of diverse professionals that should be invited to share their work more often. Their DiversityEEB platform lists contacts of scientists who are women and/or underrepresented minorities, stating that “studies have shown that a more diverse group is generated when candidates are identified from a list, rather than selecting based purely on recall.”

Meghan Duffey, an assistant editor for the American Naturalist, founded DiversifyEEB when she realised, through her search to find reviewers for an article, that she immediately thought of well-known white men for the job even though there were people from more diverse backgrounds who were just as well suited. Recognizing that subconscious biases enable this preferential treatment, she created this directory as a way to recognise diverse ecologists and evolutionary biologists who are doing equally important and relevant work. It is a comprehensive, well-structured interface that includes easily accessible contact information. We would love to see someone from this list as one of our next Distinguished Speakers.

For the full list, please see : **https://diversifyeeb.com/**

Increasing the diversity of the students

How to increase diversity

The recruiting process needs to be revamped. Not only is the SES program failing to recruit enough students in general, but the makeup of the group that does attend is

often lacking in diversity. If the SES program wants to continue to compete as a nation-wide semester program, it must adapt to the new standard of diversity and active support for diversity that people around the nation in all different fields are recognizing is long overdue. Increasing diversity begins at our recruiting process. Below are a few problems we have identified with the recruiting process, along with suggestions to mitigate them:

1. **Proactively conveying a culture of anti-racism:** we are increasingly learning that simply being quietly not racist is not enough to create a welcoming and inclusive workplace; we must be actively anti-racist. This means that even during the recruiting process, the SES program must convey that it is actively working towards recognizing and mitigating the ways in which scientific research has historically erased or taken advantage of low income/communities of color. This means reassessing not just what is taught during the program, but taking a close look at what is not taught, and why.
2. **Recruiting from diverse institutions:** Repeatedly recruiting SES students from the same pool of universities makes diversifying the student body difficult. One way to recruit more diverse students is by going to Historically Black Colleges (HBCU's), of which there are nearly a hundred in the United States.
3. **Improving our accessibility:** The cost of physically sending a recruiter to a university is very high, and busy-college schedules often drastically reduce the interaction time between recruiters and students. Additionally, in-person conversations with recruiters is a daunting experience for a lot of students. Hosting virtual information sessions and conferences would greatly reduce the amount spent traveling by the recruiters themselves and provide more flexibility to students who might not be able to fit a physical visit into their schedule, but could watch a recording of a virtual information session.
4. **Establishing a virtual presence:** Selling Massachusetts as a study abroad location is hard. A more modernized website with photos and a layout that showcases the novelty of the science conducted during the program would convey a better sense of the true uniqueness of this opportunity. A more accessible interface would allow students to toggle through the world-renown faculty, our scientific alumni, and testimonials and photographs of the course that would convey more accessibility and community.
5. **Building a stronger alumni network:** The SES program is reputed for producing successful and well-established scientists that are scattered across the globe. Facilitating these connections from the time in our classroom would dramatically increase the network new students are able to access. Further, having career pieces from our SES alumni would highlight the variety of openings SES creates for students. Through the process of working on this document, we

have engaged with alumni dating back to the 2008 cohort who all are more than excited to engage with recent SES cohorts. Students from low income/communities of color often do not have access to the kind of mentorship or network needed to succeed in scientific fields, so creating a more connected alumni network would make the SES program more appealing to a wide range of students.

6. **Longer-term recruiting:** From our personal experiences and conversations with the recruiting staff, it is evident that the best form of recruitment is through faculty member recommendations to their students. Having a constantly changing recruitment staff from year to year comes in the way of reinforcing these crucial relationships. Rethinking the way recruiting works for SES on a long-term scale would be beneficial both to the program and to the students.
7. **Modernizing the sign-up/application process:** When interested students write their contact information using pen and paper at the end of an information session, they're writing is often illegible which makes it more likely to have incorrect contact information. This can be remedied by having an electronic tablet for students to use to sign in at information sessions. This seems incredibly simple, but has been mentioned by recruiters themselves as a barrier to recruitment.

How do we allow diversity to thrive

We need to actively acknowledge that we can never completely comprehend the realities of students coming in. The lessons we learned from the almost-lynching of Vauxx Rush Booker at Monroe Lake, Indiana and Chris Cooper in Central Park are the most recent pieces of evidence that natural spaces are not as open to non-white people as they are to white people[1]. This is especially relevant to the study of the environment where scientists must venture into rural and remote regions of the country to study natural systems. Conversations about what it is like to work in such work environments go a long way as an educational experience, especially for the diverse students that we've attempted to recruit.

Engaging with students from different backgrounds in Cape Cod - an environment possibly very different from that where they are coming from - can be jarring. Students may also be entering with pre-existing mental health conditions. This should not be seen as a deterrent - rather, we must seek ways to provision for their health and safety.

1. Students need better access to mental health resources provided by MBL student programs. As an institution that houses hundreds of students per year,

[1] https://www.vice.com/en_us/article/889qxx/its-time-for-environmental-studies-to-own-up-to-erasing-black-people

the MBL should have a system of support similar to the ones provided by universities, particularly for the semester-long, intensive program like SES that the MBL hosts. The MBL should utilize the resources of the University of Chicago for guidance and establishment of an in-place mental health network. The influx of teletherapy brought about by the Covid-19 pandemic could also serve as a way to find more appropriate matches for students seeking therapy.

2. The MBL has the institutional support of the University of Chicago, which already has training programs in place for dormitory TA's in the Hyde Park campus that include but are not limited to emergency crisis response, mediation and confrontation. The SES program involves a lot more close proximity interaction between students due to the relative isolation of Woods Hole. As the first point of contact for SES students, the SES dorm RAs should be required to go through an intensive and rigorous training program modelled on those offered by the University of Chicago.

Encouraging and Implementing Intersectional Content in the SES curriculum

Environmental research is inherently a social endeavor. We apply for funding through organizations that have various aims, engage with local community members while getting access to research stations, and often even directly study anthropogenic effects on ecosystems. Through this program, it was evident that the relation between humans and natural systems are inescapably intertwined, be it from forest fragmentation in the Amazon Rainforest to the installation of PRBs to intercept wastewater in Falmouth. One of the greatest failures of the scientific community has been our inability to effectively communicate the urgency and relevance of environmental degradation and climate change. This has largely been because the perceived neutrality of the scientific method has often allowed scientists to feel justified in remaining quiet on the ways their biological research intersects with the social aspects of their work. However, this has the (often unintended) consequence of silencing the struggles that these environmental shifts have on vulnerable communities, particularly low-income communities of color .

A holistic approach, however, isn't new to many of our faculty members at all. For example:

1. Dr. J. Galloway worked on demonstrating the effect of neighbourhood wealth on nitrogen loading in the city of Baltimore.

2. Dr. C. Neill was in active collaboration with Dr. P. Brando at the WHRC where they could attribute Amazon fires in 2019 to forest fragmentation that was an outcome of changing global dietary preferences in China and India.
3. Dr. J. Mellilo was the associate director of the US President's Office of Science and Technology Policy in Washington DC on the political front of environmental management.
4. Dr. J. Lloret studied the impact of watersheds on mangroves in Central America.

Our educational experience would be greatly enhanced with a more directed emphasis on the intersectional work that the faculty already do. We understand that a common faculty concern is that placing a more social emphasis on scientific issues will detract time from getting through the intensive , skill-based approach in which the SES program prides itself. However, we are not asking that you compromise on the scientific content. Stressing the social aspects of our environmental research not only addressing *why* we are doing the research but also makes our research that much more valuable. If we know that our faculty members are intensively working on the intersection between society and the environment, we want to hear about the journey they've had in building relations with non-scientific community members. We want to hear about the difficulties of working with individuals who have conflicting motives behind supporting our science. As much as we enjoy hearing the incredible insights of a published piece of research, we also want to understand the failures and shortcomings of scientific work not being funded or translated to policy or impacting the communities in most need of help. This will turn us into more impactful scientists who leave this program with the drive that is necessary to take on the urgent task of mitigating environmental degradation and climate change. The truth is, students do not stop being students of color or students from low-income families when they enter the SES classroom. Colleges and institutions across the country are realizing that recognizing the ways in which the problems that vulnerable communities face intersect with work in other fields makes for stronger, more productive work.

Recommendations:

Science Writing Seminar

Through the scientific writing seminar, we learned the importance of telling people's stories as a way to engage with the communities that surround our scientific research. The course also did a fantastic job with providing us with tools to practice explaining difficult scientific concepts in a way that non-scientists can understand. However, we

would like to take this a step further, and be actively supported to tell stories not just of the scientists behind the research, but of the communities being researched as well. For example, scientific writing papers involving nitrogen or other nutrient cycles should include mandatory background on the adverse ways in which nitrogen loading disproportionately affects low income, communities of color. Papers written about the Crane Wildlife Management Area should not only include mentions of slash-and-burn practices historically used for management by the Wampanoag Tribe, but should also include the opinions that members of the Wampanoag Tribe living in the area now have regarding this practice. By actively telling students in the course that including these sides of their research are an expectation of the program, the SES can better set a tone of conscientious, active anti-racism. We would be happy to work on this with our instructor.

Engagement with local tribal members

Throughout our course, particularly while engaging with the Frances Crane Wildlife Management Area, tribes we were told that native peoples once inhabited the area, and that prescribed burning was a common practice performed on the land which we studied. However, the tribe- the Wampanoag Tribe - was never mentioned by name, and neither was the fact that the tribe currently has 2,600 active members that are actively fighting to keep the small amount of land they still have sovereignty over from being taken away.

We repeatedly address the point of ecosystem services that are broadly split up into four categories: supporting, provisioning, regulating, and *cultural* services. Our program deeply explores the first three, but does not adequately address the fourth. By not doing so, the SES program is implicitly conveying to its students that these issues are separate from the research we conduct, despite that research taking place on the very land that the Wampanoag Tribe has continued to understand for decades. Wouldn't the best resource to describe what the land has looked like historically be the people who have been here the longest? We encourage SES to include these valuable and insightful reservoirs of knowledge. This can be done by :

1. Sharing well-researched, up-to-date information about the status of the Wampanoag Tribe when talking about the Frances Crane Wildlife Management Area
2. Inviting a member of the Wampanoag Tribe (easily found on their website's contact page https://mashpeewampanoagtribe-nsn.gov/) to come speak to the SES class
3. Continuing to encourage us to pose questions regarding what our reference point is when discussing how we wish to conserve land in all of the areas in which we conduct fieldwork.

Informal TA-led dinner/movie night
There is a vast number of documentaries, books and non-scientific articles describing the inextricable bond between ecosystems and the people that are a part of them, ranging from the public health ramifications of ecosystem degradation to odes to the bonds people have fostered with the lands they inhabit. The TAs for the 2020 SES course have stated that they would love to take the initiative to host informal dinner/movie nights to discuss the importance of including the different viewpoints that should be included in the scientific approach to studying ecosystems. This would be guided by a discussion informally led by TAs with the aim of drawing links between social issues and topics we have been taught in class. These discussions are not be assessed, nor are they encroaching on people's time (some days we have precious little); this could simply be a great group activity for students to relax, watch something entertaining with their peers, and take a small step towards a culture shift of valuing marginalized communities while engaging in the environment.

Examples of Resources

1. **2018 Woods Hole Diversity and Inclusion Report:** As a first step, we would like to ask SES to revisit the Diversity and Inclusion report from 2018 and think about how SES fits in to some of the racial justice issues the MBL needs to combat as a whole. https://www.capeandislands.org/post/woods-hole-science-institutions-stung-diversity-report-preponderance-overt-racism?fbclid=IwAR0PhyMx6f72Ge525vbdrvmSZcb1bWe5_YN37tkq0wG8XRZYhjx3tjGnvV4#stream/0
2. **Doris Duke Conservation Scholars Program:** an example of an intensive,field based, long-term environmental program (2 summers) that provides both rigorous training in field methods while also placing a heavy emphasis on the importance of intersectional work. The program, much like SES, also prides itself in serving as a jumping-off opportunity for young scientists, but provides mentorship in ways that are more accessible and proactively supportive of diverse students. Please visit their websites: https://conservationscholars.ucsc.edu/ http://uwconservationscholars.org/
3. **Woods Hole PEP Program:** Program developed with 6 Woods Hole research universities and University of Maryland - Eastern Shore (a Historically Black College

(HBC)). It's primary focus is science with a curriculum similar to SES but with a focus on recruiting minorities. Website: https://www.woodsholediversity.org/pep/

4. Articles:
   https://www.washingtonpost.com/outlook/2020/06/03/im-black-climate-scientist-racism-derails-our-efforts-save-planet/?fbclid=IwAR3rwKANmFwwQ3HXv1kwqeR72Gq3KWrrFRW-cUfI22ycuo3UW-9aoxeaEDA

   https://diverseeducation.com/article/166456/

   https://www.vice.com/en_us/article/889qxx/its-time-for-environmental-studies-to-own-up-to-erasing-black-people

Thank you for taking the time to review this document. Please contact Khashiff Miranda (khashiffm@uchicago.edu) and Kyra Madunich (kamn2015@mymail.pomona.edu) to discuss!