

Diversity, equity, and inclusion in physical oceanography

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Definitions

- **Diversity:** the recognition of the visible and invisible physical and social characteristics that make a group of individuals different from one another.
- **Equity:** the enactment of specific policies and practices that ensure equitable access and opportunities for success for everyone. To be equitable, we cannot treat everyone the same; we must treat individuals according to their needs.
- **Inclusion:** bringing together and harnessing these diverse forces and resources, in a way that is beneficial, by creating an environment of involvement, respect, and connection—where the richness of ideas, backgrounds, and perspectives are harnessed to create value.

(Adapted from 500 Women scientists inclusive meeting guide)

Why do we need diversity?

- Make the most of the talents of the whole population
- Representation of all groups affected by science
- Diverse teams make better decisions
- Homogeneity is an outcome of bias – the opposite of selection based on merit.



Diverse teams feel less comfortable, and that's why they perform better, Rock, Grant and Grey, HBR, 2016

What we mean by diversity in science

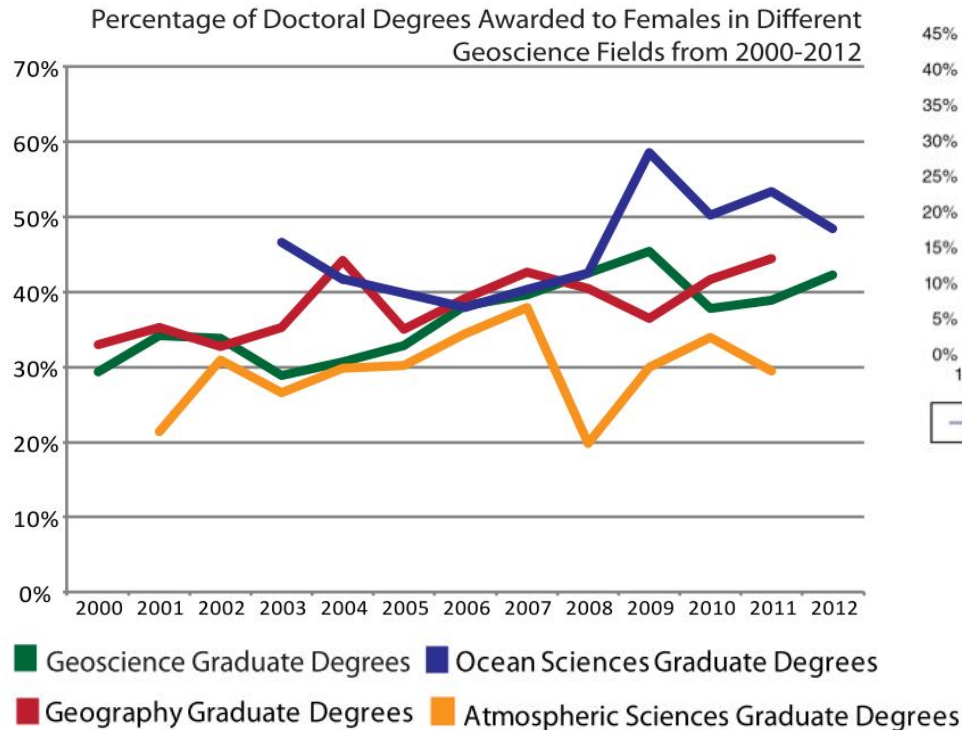
Some groups (e.g. white, cis-gender straight men from higher income/education backgrounds) have historically been over-represented in science. Other people with equally good potential to become scientists have been prevented from doing so due to bias based on:

Gender, Racial and ethnic group, Religion, Sexual orientation, Family income and status, Disability, Age, etc, etc

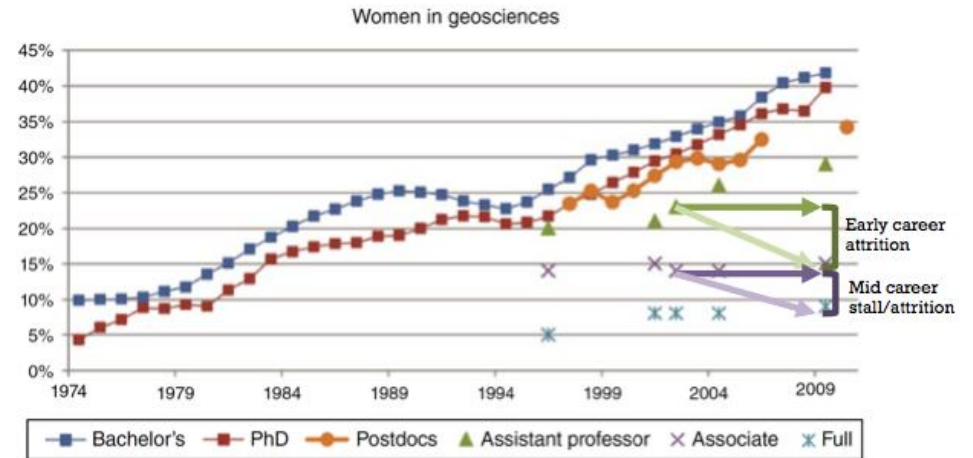
A diverse group of scientists will (a) better represent the US/world population at large; (b) include people with different view points/experiences/priorities

Who is missing from this room?

Gender representation in geoscience and oceanography

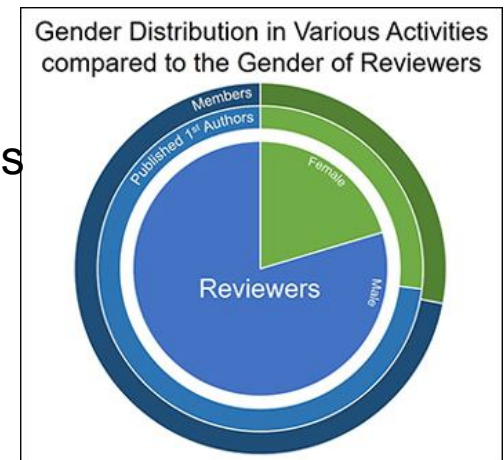


PhD gender ratio close to 50%, but less representation at higher career levels and selected expert positions such as reviewers.



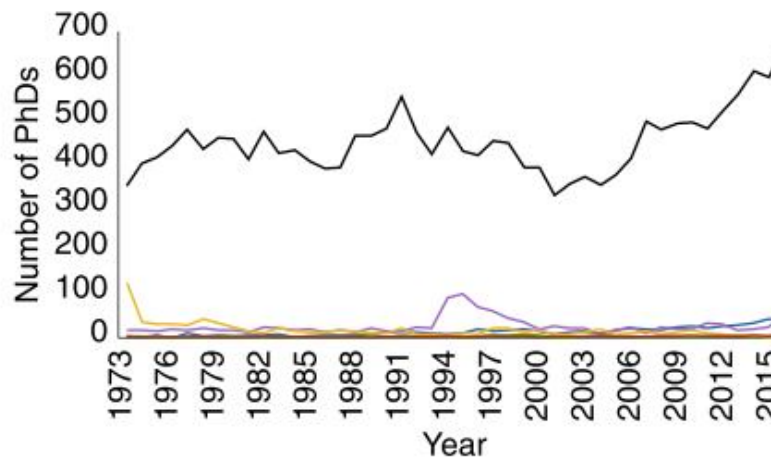
Data from NSF, 2013 and AGI 1996-2012

Gender ratios at AGU, reviewers v. membership



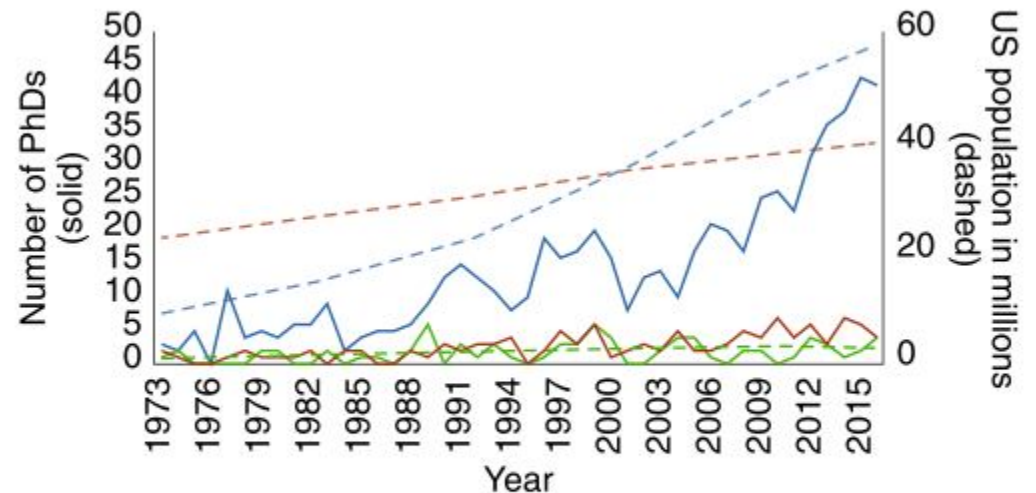
Representation of historically marginalized groups in USA geoscience PhDs

b By race and ethnicity (subfields combined)



- White, non-Hispanic
- Native American, non-Hispanic
- Asian, non-Hispanic
- Black, non-Hispanic
- Hispanic or Latino
- Other or unknown

c For underrepresented minorities only (subfields combined)



- Geoscience PhDs
- US Population
- Hispanic or Latino
- Native American, non-Hispanic
- Black, non-Hispanic

NB: includes domestic students only

“No progress on diversity in 40 years”, Bernard and Cooperdunk, Nature Geoscience, 2018

Impediments to equality in oceanographic careers

- **Explicit bias:** conscious discrimination, e.g. prohibition of women from US research vessels, racial exclusion from educational institutions. Discrimination based on race/sex is now illegal in USA.
- **Structural barriers:** factors inherent in the career structure which although not explicitly discriminatory, disproportionately impact specific groups.
- Examples: combining maternity and career; mobility required for advancement up early career ladder, requirement for (poorly paid) internships to gain entry to graduate school.

Equality



The assumption is that **everyone benefits from the same supports**. This is equal treatment.

Equity



Everyone gets the supports they need (this is the concept of "affirmative action"), thus producing equity.

Justice



All 3 can see the game without supports or accommodations because **the cause(s) of the inequity was addressed**. The systemic barrier has been removed.

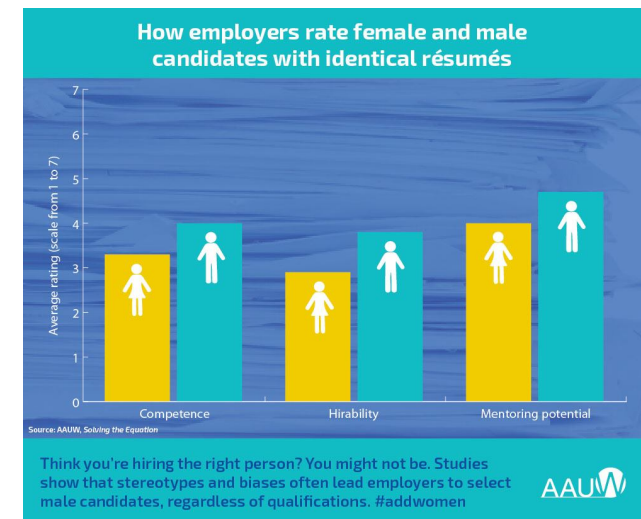
Removal of systematic barriers often benefits many groups.

Impediments to equality in oceanography

- **Implicit bias:** Attitudes or stereotypes that affect our understanding, actions and decisions in an unconscious manner
- Humans naturally gravitate toward others like us: “affinity bias”
- Being able to make quick “gut” decisions is an evolutionary advantage, but can interfere with rational decision-making.
- We all have implicit bias, based on our own experiences/filters.

Examples:

- faculty more likely to hire candidate with male name, than female name, given identical CVs (Moss-Racusin et al, 2012),
- abstracts with female names ranked lower than those with male names (Knoblock-Westerwick et al, 2013),
- evaluations of online courses higher for instructors with male names (MacNeill et al, 2014),
- reference letters in geosciences (Dutt et al, 2016),
- faculty more likely to respond to email inquiries from students with “white male”-sounding names (Milkman et al, 2014)



Impediments to equality: Harassment and microaggressions

Harassment: gender-based and sexual harassment, racially-based harassment, includes verbal, physical harassment, unwanted sexual advances. Continuous and offensive comments are illegal under EEO law.

Microaggressions are words and/or behaviors that insult, invalidate or exclude

- Using gendered phrases
- Speaking over or interrupting members of marginalized groups
- Expecting women to perform “house-keeping” e.g. making coffee, taking notes
- Questioning people of color’s credentials or right to be present
- Leaving members of marginalized groups out of opportunities
- Focusing attention on the white men in a group.
- Not giving members of marginalized groups credit
- Invading space

Impediments to success

- **Stereotype threat**: a belief that one may be evaluated based on a negative stereotype causes individual to perform poorly (hence confirming the stereotype).

- **Imposter syndrome**: feelings of inadequacy that persist despite evidence of success.

A net effect of implicit bias, structural bias, harassment, microaggressions, stereotype threat, imposter syndrome is the attrition of talented scientists from marginalized groups – a negative impact on science.

Focus on one group – women in physical oceanography – lead to creation of MPOWIR....

MPOWIR Overview



MPOWIR (Mentoring Physical Oceanography Women to Increase Retention) is a community mentoring program designed primarily to increase retention of women physical oceanographic Ph.D. recipients focusing on late graduate student through early career.

Initiated in 2005, full program has been running since
2008

Funded through peer-reviewed proposals to NSF,
ONR, NASA

MPOWIR Program Elements

- **Pattullo conferences**
 - Biannual conference brings early career women and nonbinary physical oceanographers together with senior physical oceanographers of all genders for a 2.5 day meeting focused on discipline-based mentoring.
- **Mentoring groups**
 - Groups of 6-7 women and nonbinary early career phys. oceanographers, and 2 senior women phys. oceanographers meet for a monthly teleconference, for the purpose of confidential, personalized mentoring.
- **NASA Speaker Series**
 - 2 women and nonbinary early career scientists are chosen to give a seminar at a NASA JPL and GSFC to familiarize early career physical oceanographers with the research conducted at the NASA labs and to expose NASA scientists to early career scientists in academia.

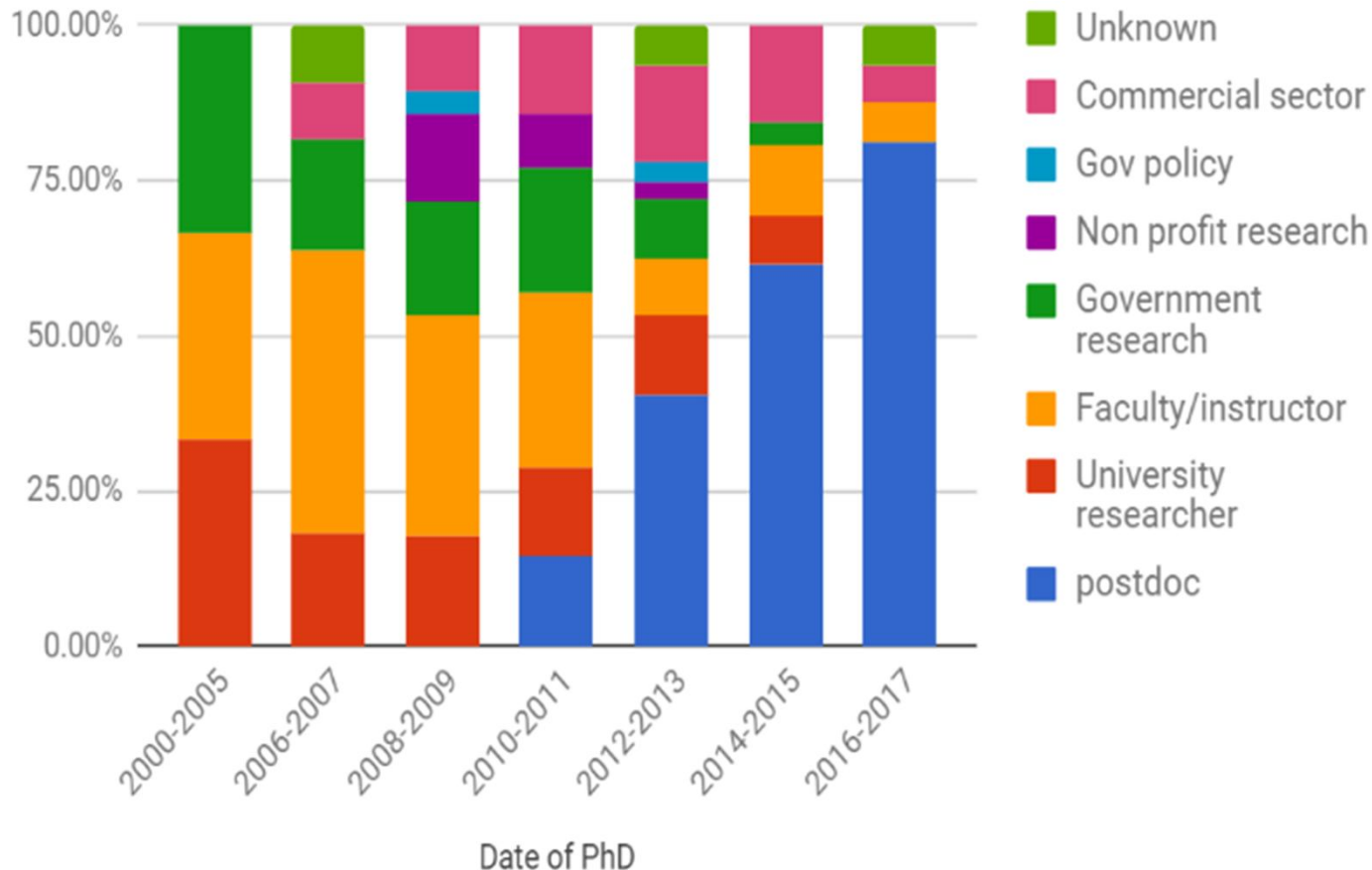
(Only open to US-based scientists)

MPOWIR Program Elements

OPEN TO EVERYONE!

- **Sponsored events at national meetings**
 - Forum for communication with the whole oceanographic community
- **Webinar series**
 - Semi-annual; Focus on early career topics, provide continued support for previous participants, expand gender neutral participation, and reach out to a broader scientific community
- **Surveys and Databases**
 - Assess the effectiveness of MPOWIR activities, determine community mentoring needs, and evaluate progress in retention.
- **Website: www.mpowir.org**
 - Repository of resources for mentoring and physical oceanography careers

MPOWIR Participant Career Progression



- Able to determine current career status of all but 9 of 173 MPOWIR participants as of May 2017
- Ph.D.'s earned prior to 2012, 80% are in faculty or university/government/non-profit research positions
- MPOWIR is very successful at reducing the loss of physical oceanographers from the field, as well as promoting participants into prominent academic and research positions

Is this retention of women in physical oceanography seen in career progression in academia?

Percentage of female faculty

	2007 Physical Oceanography	2017 Physical Oceanography
Assistant	36%	39%
Associate	19%	35%
Full	10%	19%
Total Percent Female	18%	26%

Gender ratio in physical oceanography in 13 institutions in USA shows improvement over the past decade.

MPOWIR summary

- MPOWIR has succeeded in providing valued mentoring to women physical oceanographers over a decade
- MPOWIR participants are being retained in physical oceanographic careers
- Physical oceanography academic tracks have improving gender balance

See: Meeting Mentoring Needs in Physical Oceanography: An Evaluation of the Impact of MPOWIR. *Oceanography*, 2018, Mouw, Clem, Legg, and Stockard.

MPOWIR is not enough: we need to change the culture

- MPOWIR has focused on giving the members of a marginalized group (women in PO) the support and training to help them overcome impediments to their careers.
- This requires the members of the marginalized group to adapt to the existing structure.
- Instead, we need a change of culture.
- Culture has to be changed by those in power – the historically privileged group.
- Attrition of historically marginalized groups is not due to a “leaky pipeline” – we need to remove barriers.

What action can we take to improve diversity/equity/inclusion?

Countering Implicit Bias

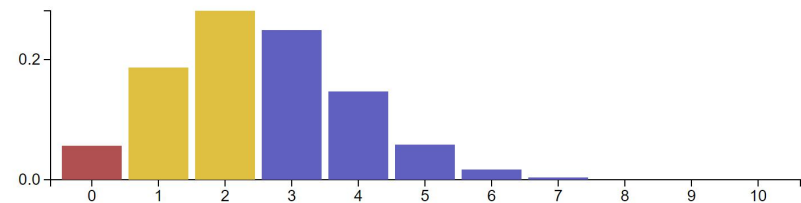
- Know your own biases: take online implicit bias test: <https://implicit.harvard.edu/implicit/selectatest.html>
- Acknowledge implicit bias exists and take steps to correct for it.
- Conduct a survey of your own bias, evaluate your own decisions for bias.
- Examples:

- How homogeneous is your list of collaborators?
- How homogenous is your list of mentees?
- How homogenous is the speaker list for your conference?

- Commit to refusing to participate in unrepresentative meetings, “manels” etc.

Conference Diversity Distribution Calculator

How many would you expect in a random selection of people, assuming they constitute % of available speakers?



This selection has:

- a **47%** chance of **over-representing women**
- a **5.6%** chance of **not representing women at all**

Over-representation is therefore about **8.4 times** as likely as no representation.

<http://aanandprasad.com/diversity-calculator/>

Countering implicit bias continued....

- If you find bias, then do something about it!
- We make biased decisions when we “go with our gut”
- A homogenous selection of people is evidence that people have been chosen based on membership of an affinity group, not based on merit!
- **To reduce bias, slow down decision making, replace intuition with formal analysis**
- Examples:
- For hiring a postdoc:
 - don't just reach out to your network of close colleagues asking for their best students
 - Make an objective list of the skills needed for the job and advertise widely
 - Have a rubric for evaluation, and score applicants against that rubric
- For invited speakers:
 - Don't just use the first list of names that come to mind.
 - Decide on the topics you want to be covered, use literature search to find the people publishing in that area
 - If you can't come up with diverse speakers, reach out of your network for help.

Countering implicit bias

- Reference and nomination letters:
 - don't use gendered or stereotyped phrases
 - mention research and publications
 - emphasize accomplishments
 - keep it professional
 - don't evoke stereotypes.

http://csw.arizona.edu/sites/default/files/avoiding_gender_bias_in_letter_of_reference_writing.pdf

Eliminating microaggression

- To avoid committing microaggressions, use inclusive language, avoid making assumptions about others. Think!
- If you or a colleague are called out, don't be dismissive or defensive, instead apologize.
- Your intent e.g. "it was only a joke" "I didn't mean to be offensive" doesn't matter – impact on the other person is what matters.
- Call out microaggression in others:
 - Assume intent is not malicious
 - Impact is most important
 - Gently make the invisible visible

The goal is to make everyone feel that they belong here, not to "other" them.

Eliminating Sexual Harassment

- Read the NASEM report
- Any sexual relationship where there is a power differential is harassment
- Any unwanted sexual attention is harassment
- Believe victims – most victims only come forward to protect others, because the cost to victims for reporting is huge.
- Don't work with or protect harassers.
- Harassment is research misconduct.
- Implement recommendations of NASEM report at your institutions/meetings.

Removing structural barriers

- Find ways to accommodate the needs of the individual so people can succeed based on their scientific contributions, not their gender/income/physical ability etc...
- A few examples:
 - Childcare/lactation facilities for conferences
 - Adapted tenure clock
 - Remote working and conference arrangements
 - Microphones for all speakers at conferences
 - Color-blind friendly figures
 - Accessible fieldwork
 - Gender-neutral bathrooms
 - Eliminate fees for applications
 - Eliminate expensive biased entrance tests
 - Eliminate age limits on early career prizes

Countering stereotype threat and imposter syndrome

- Exposure to positive role models
- Reinforce individual's positive qualities before assessment
- Give praise where it is due
- Reward competence, not confidence!

Summary

Help change the culture of physical oceanography to achieve a more diverse, equitable and inclusive workplace by:

- Countering implicit bias,
- Eliminating microaggressions,
- Eliminating sexual harassment,
- Removing structural barriers
- Rewarding competence

Allowing everyone to do their best work in a place where they feel recognized and welcomed will lead to better science!

Some Resources

- 500WomenScientists guide to Inclusive Scientific Meetings
<https://500womenscientists.org/inclusive-scientific-meetings>
- MPOWIR: <http://mpowir.org/>
- Geosciences Opportunities for Leadership in Diversity (NSF-GOLD):
<https://cpaess.ucar.edu/gold/resources>
- National Academies report: <https://www.nap.edu/catalog/24994/sexual-harassment-of-women-climate-culture-and-consequences-in-academic>